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**NUTRITION AND POVERTY:
THE CASE OF LONE-PARENT HOUSEHOLDS
IN THE UK**

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ABSTRACT

This thesis examines the relationship between nutrition and poverty through a British case study, drawing on historical material and recent national and international experience of the policy agenda for nutrition. It has two main objectives. First, to investigate nutritional conditions in low income households in contemporary Britain by means of a survey in a group known to be poor, namely lone-parent families. The survey addressed whether there is evidence of nutritional deprivation, and, if so, who suffers it, and to what extent it is attributable to poverty, rather than lack of motivation or skills. Secondly, to contribute to contemporary debate about poverty and potential policy responses, particularly where food is concerned.

A random cross-sectional survey of 200 lone-parent households in Greater London was carried out. Nutrition data were obtained from individual 3-day food intake records, for each parent and at least one of their children, and from a food frequency questionnaire. Three sets of nutrition outcome indicators were derived. Household budgeting and management techniques in relation to food and health were investigated by taped, semi-structured interviews. The association between income, other socio-demographic factors and support networks, and dietary patterns and nutritional risk were examined.

The survey showed that however diligent and skilled the poorest lone parents were in budgeting and food shopping, their nutrient intakes were always lower, and their dietary patterns less healthy, than those who were not poor. Children's diets were less affected. Many parents, despite their straitened economic circumstances, nonetheless wanted, and actively sought, quality in their family's diets. The thesis concludes by reviewing how measures of nutritional deprivation, with its consequences for health and wellbeing, could contribute to defining and measuring poverty, and the potential for intervention at state and local levels to improve poor people's circumstances with regard to food.

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CONTENTS

Abstract	2
Acknowledgements	3
Contents	4
Appendices	6
Tables	6
Figures	7
Abbreviations	7
Notes on word conventions	9
 chapter 1 Nutrition and poverty: introduction	 10
Definitions and measurement of poverty	11
Definitions and measurement of nutritional deprivation	14
Diet and poverty in contemporary UK: a review of the evidence	18
Nutrition and poverty review:	
a) nutrition as a component of poverty lines	23
b) nutrition as a contribution to poor health outcomes	26
c) poverty as a cause of poor nutrition	30
d) poor nutrition as an aspect of deprivation	33
 chapter 2 Nutrition: the policy arena	 36
Policy in the food and nutrition arena	36
Goals of nutrition policy	40
Nutrition policy in the UK	45
Nutrition and low income/poverty	48
 chapter 3 The case of lone parents in the UK	 53
Lone parents and poverty	55
Nutrition and diet in lone-parent families	58
Drawing and contacting the lone-parent household sample	60
Characteristics of the sample contacted	63

chapter 4	Nutrition in lone-parent households: case study methods	69
	Nutrition indicators used	69
	Methods for collecting nutrition data	73
	Methods for collecting social, demographic and economic data	76
	Methods for investigating food beliefs and practices	77
	Methods for investigating budgeting in relation to food	79
	Data entry and analysis	80
	Indicators of poverty	81
chapter 5	Nutrition in lone-parent households: nutritional results	84
	Anthropometric indicators	84
	Nutrient intake adequacy	85
	Dietary variety indicators (Variety Frequency Scores)	101
	Healthy dietary patterns	105
chapter 6	Nutrition in lone-parent households: food choice	111
	Food choice: models for understanding	111
	In-depth interviews	113
	Cluster analysis of food choice responses	125
chapter 7	Discussion, policy implications and conclusions	133
	Discussion: poverty	136
	strategies for managing a tight budget	137
	ethos of healthy fresh food	141
	ethnicity	143
	smoking	143
	Implications for policy: poverty definition and measurement	144
	workers with low-income families	146
	policy community	148

APPENDICES

1	Questionnaires	159
2	Data entry and analysis procedures	188
3	Adjustment for household size and composition	195
4	Lone parents: Body Mass Index data	197
5	ANOVA results for adequacy of iron, NSP, folate, vitamin C intakes, Variety Frequency Scores and Healthy Dietary Scores	198
6	Correlation matrices for "food choice" and "food aims" variables	222

REFERENCES	225
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TABLES

3.1	lone-parent households: sampling response rates	62
3.2	characteristics of lone parents in nutrition and national surveys	64
3.3	household weekly income: total and adjusted for household size and composition	67
5.1	lone parents: energy and nutrient intakes, % Dietary Reference Values	86
5.2	British women: energy and nutrient intakes	87
5.3	female lone parents: energy, fat and NSP intakes, % Dietary Reference Values, by ethnicity	88
5.4	dependent children: NSP intakes, % Dietary Reference Values	89
5.5	dependent children: fat, NSP intakes, % Dietary Reference Values, by age	90
5.6	dependent children: NSP intakes, % Dietary Reference Values, by parents' ethnicity	91
5.7	lone parents: energy, fat and NSP intakes, % Dietary Reference Values, by receipt of Income Support	92
5.8	lone parents: energy, fat and NSP intakes, % Dietary Reference Values, by the <i>material poverty index</i>	93
5.9	lone parents: energy, fat and NSP intakes, % Dietary Reference Values, by the <i>food anxiety poverty index</i>	94
5.10	lone parents: % Dietary Reference Values for iron, folate, vitamin C and NSP intakes of smokers and non-smokers by the <i>material poverty index</i>	95
5.11	female lone parents: fat and saturated fat as % energy intakes	109

FIGURES

1.1	food access and nutrition outcomes	31
3.1	socio-demographic characteristics of lone parents in the UK	57
5.1	factors associated with lone parents' nutrient intake adequacy: iron, NSP, folate and vitamin C	98
5.2	factors associated with children's nutrient intake adequacy: iron, NSP, folate and vitamin C	99
5.3	factors associated with higher overall food variety in lone parents' diets	102
5.4	factors associated with higher overall food variety in children's diets	103
5.5	factors associated with higher fruit and vegetable variety in lone parent's diets	104
5.6	factors associated with higher fruit and vegetable variety in children's diets	105
5.7	factors associated with higher healthy diet scores for lone parents	106
5.8	factors associated with higher healthy diet scores for children	107
6.1	cluster solutions for food choice and food aim variables using absolute values of the correlation coefficient	126
6.2	cluster solutions for food choice and food aim variables using signed values of the correlation coefficient	127
6.3	five cluster solution to food choice and food aim answers combined	128
6.4	five cluster solution to lone parents' views on food choice	129
6.5	four cluster solution to lone parents' views on food aims	131
7.1	food access: the policy arena	135

ABBREVIATIONS

ANOVA	Analysis of variance
ANS	Adult Nutrition Survey
BMI	Body Mass Index
BMR	Basal Metabolic Rate
BSE	Bovine Spongiform Encephalopathy
COMA	Committee on Medical Aspects of Food Policy (DH)
DfEE	Department for Education and Employment
DH	Department of Health
DHSS	Department of Health and Social Security
DRV	Dietary Reference Value(s)
DSS	Department of Social Security
EAR	Estimated Average Requirement
ESRC	Economic and Social Research Council (UK)
FAO	Food and Agriculture Organization of the United Nations
FES	Family Expenditure Survey
FFQ	Food Frequency Questionnaire
ht	height
HBAI	Households Below Average Income
HDS	Healthy Diet Scores
HEA	Health Education Authority
ICN	International Conference on Nutrition (FAO/WHO)
IS	Income Support
LIF	Low Income Families
LIPT	Low Income Project Team
LRNI	Lower Reference Nutrient Intake
MAFF	Ministry of Agriculture, Fisheries and Food
MRC	Medical Research Council
NACNE	National Advisory Committee on Nutrition Education
NCC	National Consumer Council
NCH	National Children's Homes
NFA	National Food Alliance
NFS	National Food Survey
ngo	non-governmental organization
NHS	National Health Survey
ns	not significant
NSP	Non-starch Polysaccharide
NTF	Nutrition Task Force
OPB	One-parent Benefit
p	statistical probability
PO	Post Office
PSNS	Pre-School Nutrition Survey
r	correlation coefficient
r ²	goodness of fit
RDA	Recommended Daily Amount
RNI	Reference Nutrient Intake

ABBREVIATIONS cont

se	standard error
st. dev.	standard deviation
SPSS	Statistical Package for the Social Sciences
wt	weight
VFS	Variety Frequency Scores
WHO	World Health Organization of the United Nations
WIDER	World Institute for Development Economics Research
yrs	years

NOTES ON WORD CONVENTIONS

A number of words or phrases are used throughout the thesis in accordance with current conventions. They are:

absent parent	This phrase denotes the biological or adoptive parent or guardian who does not have legal day-to-day care of a dependent child. They may or may not be "absent" in any emotional, financial or physical sense.
parent-with-care	This phrase denotes the biological or adoptive parent or guardian with day-to-day care of a dependent child. They may or may not exert exclusive caring responsibility.
lone parent	This is the conventional term for a parent-with-care. It is used in preference to "single" (which can mean "unmarried" or "never married") or "one" (it is possible to refer to "one-parent households" but not "one parents"); see Bradshaw and Millar (1991) and Hardey and Crow (ch1, 1991) for further discussion of the problems of terminology.

Chapter 1 NUTRITION AND POVERTY: INTRODUCTION

"By necessities I understand not only commodities which are indispensably necessary for the support of life but whatever the custom of the country renders it indecent for creditable people, even of the lowest order, to be without."

(Adam Smith (1776) An Enquiry into the Nature and Causes of The Wealth of Nations.)

People who are destitute have to beg to eat; 'famines', however defined, affect the poor rather than the rich in a country. The recent International Conference on Nutrition (FAO/WHO, 1992) recognized poverty and lack of education as primary causes of hunger and undernutrition - the daily struggle for subsistence seems the lot of 780 million of the world's population. The connection between poverty and the lack of food seems so obvious one would think only the remedies presented the real problem. In practice, poverty measurement is bound up with conceptual and ideological controversies in nutrition whether rich or poor countries' circumstances are considered. The role of poverty, or lack of resources, in producing states described as "malnutrition" or "nutritional deprivation" is not clearcut. Individual choice and behaviour, domestic management skills and even luck are said to play important parts.

This thesis examines the relationship between nutrition and poverty through a British case study, drawing on ideas from international nutritional problem definition. It has two main objectives:

First: to investigate nutritional conditions in low income households in contemporary Britain, by means of a survey in a group known to be poor in the UK, namely lone-parent families. Is there evidence of nutritional deprivation, and, if so, to what extent is it attributable to poverty, rather than lack of time, motivation or skills?

Secondly: to contribute to contemporary debate about poverty and potential policy response, particularly where food is concerned. What are the implications of using nutritional indicators to define and measure poverty? For those who are poor, food is often a place where economies are made, in the type eaten, by whom, and how much.

What are the consequences in terms of health or other outcomes of these "poverty coping strategies"? What is the potential for intervention to improve poor people's circumstances with regard to food¹?

The chapter begins with a brief history of the debate about definitions and measurement of poverty and of nutritional deprivation. This history is followed by a review of published evidence that poverty is associated with poorer diets in contemporary Britain. The contributions of nutritional science to the poverty debate can be identified in a number of areas, four of which are subsequently outlined to complete this introductory literature review:

- a) nutrition as a component of poverty lines;
- b) nutrition as a contribution to diminished health outcomes;
- c) poverty as a cause of poor nutritional status;
- d) nutrition as an aspect of deprivation and poverty.

Definitions and measurement of poverty

Seebom Rowntree, John Boyd Orr, William Beveridge and Peter Townsend have been seminal figures in defining and measuring poverty in the UK in the twentieth century. However, Rowntree, Boyd Orr and Townsend's concern was to understand the causes and document the extent of poverty, and, in the case of Boyd Orr, to demonstrate the consequences of poverty for nutritional conditions. By contrast, Beveridge was engaged in taking political decisions over how much money - in addition to other support in kind - the state was prepared to give the poor, and how to identify them. As Veit-Wilson argues (1986; 1987), establishing minimal standards of living, defining poverty, measuring its extent and consequence, and determining levels of state assistance to those in need, are and should remain distinct activities. That they seem inextricably linked in public discourse in the UK, not least because of it lacks a state

¹This perspective is always that of the outsider: the agenda for the research was not set by those who consider themselves "poor" in the UK today, nor was their articulation of needs and potential policy responses a primary objective. In this I continue a tradition in international nutrition - that of being an advocate for the poor on my own initiative; none has commissioned me to speak on their behalf nor given me words to say. Nonetheless, wherever possible, I try to be faithful to what I have been told.

definition of poverty or minimal living standard (Roll, 1992a; Oppenheim, 1993), is one reason for the confusion and debate over the extent and nature of poverty in the country, its consequences for nutrition, and the potential for policy intervention.

Poverty definition and measurement is thus controversial; the subject is covered extensively in the academic and public press (e.g. Townsend, 1979; Piachaud 1987; Ringen 1988; Donnison 1988; Roll 1992a; Osmani, 1992; Oppenheim 1993). Broadly speaking there are two main approaches. To identify those in "absolute" poverty, a minimum, subsistence standard of living is defined and measured, either in terms of the presence or absence of subsistence items and conditions, or by costing them and comparing household or individual income against the minimum living costs thus established. As Oppenheim says, the appeal of this definition is in its apparent clarity and moral force. For instance, 95% of those interviewed in the British Social Attitudes Survey agreed that poverty was about living below minimum subsistence (Oppenheim 1993: p7). However, operationalizing such an approach is not easy: minimal nutritional standards which constitute a major component of subsistence standards, are difficult to conceptualize and define (see below) and in fact minimal standards of living do vary between countries and ideas change (Mack & Lansley, 1985). The second approach is to identify "relative" poverty, defined in relation to generally accepted standards of living for a given time and place, these living standards not being limited to biological need (Oppenheim, 1993). Poverty then becomes social exclusion. In the UK, opinion polls and specific surveys have been used to identify public consensus over what should be included in the definition of relative poverty (Roll, 1992).

In practice the British and European social policy field commonly uses two sets of statistics which to some extent correspond to these definitions: Low Income Families (LIF) (published 1972-85 by the DSS, and since then by the Institute for Fiscal Studies under the House of Commons Social Security Committee) which are households whose income is the same as, or just below or just above, the state means-tested benefit level (the UK benefit now called "Income Support"; previously it was called "Supplementary

Benefit", and before that, "National Assistance"). Secondly, Households Below Average Income (HBAI) (published since 1988 for 1979 onwards by the DSS), which are households whose income (usually after housing costs have been taken into account) is below various thresholds, from 40% to 100% of national average household income. The LIF set implies a state defined minimal income, such that households with income below it are presumed unable to meet their basic needs. HBAI is clearly a relative measure, defining a group of households at the lower end of the income differential whose conditions and circumstances can then be characterized. Both sets of data are derived from the Family Expenditure Survey (FES) and thus neither takes account of intra-household income distribution, or gender differences in poverty (Millar & Glendinning, 1989; Jenkins, 1991), nor how long households have been poor. Both exclude those living in institutions (prison, hospital, residential homes) and the homeless. Both are defined in relation to income, rather than to expenditure, or proxy indices of deprivation.

How many households or individuals in Britain are "poor" by these definitions, and how have the figures changed over time? In 1994, 5.6 million households, representing 9.8 million people in Great Britain were living on Income Support (DSS, 1995); 25% of the UK population was living on less than 50% of average income in 1992/3 (DSS, 1994). In 1979 by contrast, 6.1 million people were dependent on Supplementary Benefit (which was replaced by Income Support in 1988) (DHSS, 1982), and only 9% were living on less than 50% of average income (DSS, 1994). These official data sets show that the numbers who are poor in the UK and the levels of inequality have grown since the early 1970's. The recent Inquiry into Income and Wealth (Joseph Rowntree Foundation, 1995) used data on both income and deprivation to confirm that this gap between rich and poor has widened rapidly since the late 1970's, (in fact, faster than in any other industrialized country except New Zealand, and more than in the previous post-war period). In part, this widening differential was because more people became dependent on benefits like Income Support as a result of higher unemployment, growing fragility of family life, and more pensioners being solely reliant on an increasingly inadequate state pension. In addition, during the

1980's and early 1990's, the actual income received by those dependent on benefits (or on low, part-time wages) fell massively relative to the income of those with full-time earnings. Levels of "absolute" and "relative" poverty increased.

Definitions and measurement of nutritional deprivation

Nutritional deprivation is often not defined in a consistent way; it is as emotive and debated topic as poverty. Indicators are needed which relate either nutrient or energy intake, or anthropometric outcomes (child growth or adult Body Mass Index - BMI) to risk of some kind, which society acknowledges to be unacceptable. Mortality has often served as the "unacceptable risk" in relation to anthropometry in poor, non-industrialized countries (smaller, thinner children are more likely to die: e.g. Dowler *et al.*, 1982; Payne, 1990) and to some extent in industrialized countries (shorter adults die younger: e.g. Waaler, 1984; Nystrom-Peck *et al.*, 1989; Barker *et al.*, 1990; fatter adults also die younger: e.g. Cochrane *et al.*, 1980; Hubert *et al.*, 1983).

Attained adult height, mortality and socio-economic status are also related (see Floud, 1992 for a good review), and there is an inverse relationship between obesity and socio-economic status in industrialized societies, particularly in women² (Sorbal and Stunkard, 1989; Gregory *et al.*, 1990). A similar relationship is observed between child growth and socio-economic status in the UK, which persist after controlling for confounding variables (e.g. among many, Rona, Swann and Altman, 1978, quoted in Blaxter, 1982; Rona and Chinn, 1984; Gregory *et al.*, 1995). Few studies explicitly trace the relationship between child growth and food intake in UK data; two exceptions are Nelson and Naismith (1979) and Lasker and Mascie-Taylor (1989). Nelson and Naismith (1979) found in a survey in London that income restriction and low expenditure per person per week on food both correlated highly with poor child growth. Lasker and Mascie-Taylor (1989) using data from the National Child

²The reasons for this gender difference are not clear, but explanations include the intense social stigma attached to obesity in women in richer societies (Carpenter and Bartley, 1994), such that women of higher economic status somehow exercise an intellectual, social and economic ability to control their body weight. Socially mobile women show the obesity pattern of their class of destination rather than origin (Sorbal and Stunkard, 1989).

Development Study, found effects of both social class and social mobility on child growth up to the age of seven. They conclude: *"the principal influence of social class [...] is through its relation to family income and how it is spent, especially differences in food consumption."* (Lasker and Mascie-Taylor, 1989, p7).

Nutritional deprivation measured by energy and nutrient intake indicators has been based on less consistent definition and seldom explicitly linked to outcomes of "unacceptable risk". Most authors simply employ either achieved percentage of requirement, or the percentage of the population or group falling below a Recommended Daily Amount (RDA) with the implicit assumption that this measures an unacceptable risk and can be called "nutritional deprivation". In practice, an RDA is the amount sufficient for the needs of most people, rather than amounts that individuals or groups are actually *recommended* to eat, in spite of the name: an individual who eats less than the RDA is not necessarily at risk. There is a distribution of requirements in a population, which in most instances is assumed to be a normal distribution, and the RDA is usually set as a consensus of a committee of experts at a point two notional standard deviations above the mean. That is, the RDA is defined as that which will meet the needs of 97% of the population, and cannot be used as a cut-off below which people will be "nutritionally deprived".

In the UK, the term RDA has been replaced by "reference value"³. Reference nutrient intakes can be used as a yardstick for assessing the adequacy of dietary intakes by population groups. They are derived from data based principally on avoiding risk of deficiency (with "deficiency" defined in different ways depending on the nutrient concerned: lowered body pool or tissue saturation, impaired biological function) (DH, 1991). In addition, there are a few nutrients and dietary components for which high

³*"Reference values, in particular the Reference Nutrient Intake, used to be called "RDAs" or Recommended Daily Amount for each nutrient, although they were not, in fact, amounts that individuals or groups were actually recommended to eat. They were 'the average amount of a nutrient which should be provided per head in a group of people if the needs of practically all members of the group are to be met.' To avoid the confusion over who the 'recommendation' was aimed at - providers rather than consumers - and to help users interpret dietary information on both groups and individuals, COMA [the DH expert committee - the Committee on Medical Aspects of Food Policy] used the term "Reference Values" instead. (DH, 1991, p1).*

intakes are said to incur risk of ill-health (such as fat or common salt); for these, desirable population upper intakes are given (DH, 1991). Requirements are thus probability statements about the risk of ill-health associated with low (or occasionally high) nutrient intakes. This is some way to an understanding acceptable to government of "nutritional deprivation": the lower a group's mean nutrient intake is as a percent of the reference intake, the less likely all members of the group are to be eating enough of that nutrient to avoid ill-health. The probability of deficiency increases as the percent of reference value achieved decreases. In the UK there is also a "lower reference intake" (LRNI) for some nutrients, at two notional standard deviations below the estimated average requirement. This level represents *"the lowest intakes which will meet the needs of some in the group. Intakes below this level are almost certainly inadequate for most individuals."* (DH, 1991, p3). The LRNI could be used as an indicator of intakes which carry a high risk of dysfunction and ill-health. Survey data which uses these indicators of nutritional deprivation in the UK are summarized below.

It is difficult to interpret measured low energy intakes; there is no LRNI for energy. Goldberg *et al.* (1991) identify a minimum energy expenditure at any given body weight of $1.27 \times \text{Basal Metabolic Rate}$. This is a "survival requirement" which allows *"minimal movement not compatible with long term health"* with no allowance for *"the energy needed to earn a living or prepare food"* (FAO/WHO/UNU, 1985). Thus, far from being a lower cut-off to identify a level to meet the needs of all but a small proportion of the population, this "survival requirement" is exactly that: everyone needs more than this level to live a normal social, economic, physiological life. Energy intakes are difficult to interpret as indicators of nutritional deprivation (Payne, 1992).

Boyd Orr was interested in measuring nutritional adequacy of the poor defined in terms of nutrient sufficiency. However, in contrast to Rowntree's and others' approach of using nutritional standards to define a minimal subsistence level, Boyd Orr, drawing on the "newer knowledge of nutrition" (which largely referred to work on

vitamins)⁴, employed what he called "optimum requirements". These were based on the *"physiological or ideal, viz., a state of well-being such that no improvement can be effected by a change in the diet"* (Boyd Orr, 1936, p12). Boyd Orr in fact used the Stiebling standards from the USA Government Bureau of Home Economics: a level which *"provide[d] a sufficiency, with a safety margin, of all essential dietary constituents"* (Boyd Orr, 1936, p12). This description suggests the level was probably not the optimum Boyd Orr hoped for, but similar to the present reference nutrient intakes described above: mean requirement plus two standard deviations, or sufficient to meet the needs of 97% population.

Nutritional deprivation could also be defined in terms of the type and range of foods people eat. It is difficult to meet micronutrient needs when diets are monotonous and based on few foods (Krebs-Smith *et al.*, 1987); a diverse food base is associated with healthier living and reduced risk of cancer (Buttriss, 1995) or coronary heart disease (DH, 1994a). Kant and colleagues (1993) calculated a crude "dietary diversity score" in terms of numbers of broad food categories eaten; they showed this score to be inversely related to mortality in men and women in the US N^HANES 1 follow up. There is no prescription of actual foodstuffs guaranteed to prolong life expectancy, but general healthy eating advice has been to eat "a varied diet/ lots of different foods/ at least five daily fresh fruits and vegetables", wholegrain products, leaner meat, more fish and poultry, and lower fat milk (HEA, 1993; DH, 1994a, 1994b; Williams, 1995). Households whose members cannot grow, or afford to retain or purchase such a diet, or whose local shops/restaurants/canteens do not stock the appropriate foods, could also be described as nutritionally deprived, in terms of their ability to obtain a "healthy" diet.

Nutritionists and others who have documented the impact of occupational social class or poverty on household food patterns in the UK have usually devised their own lists

⁴This "newer knowledge" led to an almost exclusive focus on nutritional explanations during the 1920's and 1930's as causes of, and solutions to, major public health problems (Petty, 1987).

of foods which might constitute a healthy or unhealthy diet (e.g. Cole-Hamilton and Lang, 1986; Whichelow *et al.*, 1991; Anderson and Hunt, 1992). They report the frequency of eating foods described as "healthy" or "unhealthy", on the assumption that those who report eating more of the former and less of the latter have a healthier diet, and vice versa. Few contemporary studies quantify "variety".

In recent years, those in the social policy field interested in defining and measuring the extent of deprivation in British or Irish societies (e.g. Townsend, 1979; Mack and Lansley, 1985; Callan *et al.*, 1993), on expert advice (Roll, 1992), have included "standard patterns of food usage" among their indicators. The food patterns used were fairly crude (having two/three meals a day for children or adults, eating fresh fruit, having meat or fish every other day and a roast or equivalent once a week) and no attempt was made to identify or quantify the health, social or other risk of not obtaining these items.

Diet and poverty in contemporary UK: a review of the evidence

This thesis primarily uses food intake indicators of nutritional deprivation. As a preliminary to the field research a number of large and small scale UK studies of nutrient intakes, dietary patterns or food costing exercises were reviewed for their methodological approaches, problems encountered and solutions devised (Dowler and Rushton, 1994). The European literature was also briefly reviewed (Dowler, 1993), but the north American literature has been excluded, partly because it is very large, and partly because social and nutritional policy responses are in some respects very different from those in the UK.

Large scale surveys of individual nutrient intakes or dietary patterns mostly publish their findings in relation to occupational social class and household composition as proxies for economic status. Whether belonging to manual social classes constitutes being poor is a moot point. However, recent national surveys also present nutrient data by receipt of state benefits, employment status, household composition and mother's education level in addition to occupational class, though no use is made of

composite indices. Some small scale surveys of dietary patterns have used benefit status or household composition as socio-economic markers. The annual National Food Survey (NFS) estimates nutrient intake per head from measurement of household intakes; these are the only national data presented by income groups as well as region and occupational social class, but the specific relationship between income and food or nutrients is not published. These data are summarized below, in Dowler and Rushton (1994) and in Craig and Dowler (1996 in press).

National surveys of nutrient intakes commissioned and/or funded by government in the UK are done annually at the household level (NFS) and less frequently on individuals of different age groups (school aged children, DH, 1989; adults, Gregory *et al.*, 1990 MAFF, 1994b ; toddlers, Gregory *et al.*, 1995; over-65's, current). In addition, national sample surveys such as the Scottish Heart Health Study (Bolton-Smith *et al.*, 1991 [both]), or the Healthy Lifestyle Survey (Whichelow *et al.*, 1991) and many smaller studies provide one-off nutrient intake data by occupational social-class for different age groups.

The NFS is a continuous survey of food purchase in 7-8,000 households a year, which estimates nutrient and energy content from food composition tables. Nutrient intakes per head and as a proportion of the DRV are shown for income groups derived from target income distributions in the MAFF sample (MAFF, 1994a, p71). These income groups cannot be compared with FES income distribution data by decile, nor with the DSS Social Security Statistics and HBAI data, so NFS published data cannot be used to deduce nutrient intakes by households in the national lower income deciles.

However, those in the NFS group E2 represent "low income households without an earner": mostly means-tested benefit recipients, which roughly correspond to LIF.

Those in NFS group A represent households with at least one earner and gross weekly incomes of £520 (for 1993) and above; those in NFS group D households with at least one earner and gross weekly incomes below £140 per week (MAFF, 1994a). Nutrient intakes were less likely to be adequate in groups E or D compared with group A, although the only large difference was in vitamin C intakes. Differences in nutrient

adequacy were more marked between households of different composition: vitamin C, folate, iron, zinc and magnesium intakes were much less likely to be adequate in households with more than three children, and in lone-parent households. There were no marked differences in the proportion of energy from fat or saturated fat between income groups or according to household composition, although lone-parent households and those with four or more children had lower fat intakes per head (68g and 76g respectively) than households with no children (98g and 94g). In terms of food energy sources, those in the lower income households obtained less energy from soft drinks, alcohol or sweets than those in the higher income groups.

No national data are available on income and nutrient intakes which have been measured on individuals. In the Schoolchildren survey, the Adult Nutrition Survey (ANS), and Pre-School Nutrition Survey (PSNS), where nutrient intakes were calculated from weighed dietary intakes recorded by each individual, data are presented according to various measures of socio-economic status mentioned above. In the surveys on children's intakes, only absolute intake data, or nutrient intakes adjusted for differences in energy intake, are given by social class. Data on adequacy of nutrient intakes (proportion of children meeting UK reference values, where these exist for children) are not presented by any socio-economic indicator, only for the whole sample.

In the ANS men and women who were unemployed had significantly lower intakes of many vitamins (especially vitamin C, carotene and vitamin E) and minerals, as did those who lived in households receiving benefits. Men and women in social classes IV and V had lower intakes of most vitamins and minerals than those in the higher social classes; these trends were most marked for calcium, iron, carotene and vitamin C. (MAFF, 1994b). In the PSNS, young children from manual social classes had lower absolute intakes for most vitamins and minerals, except sodium and potassium, than those in non-manual households. When intakes were adjusted for differences in energy intake, children from manual homes had proportionately lower amounts of carotene (a form of vitamin A found mainly in vegetables), niacin, vitamin B12,

vitamin C and vitamin E. Blood levels of most vitamins were also lower in children from manual homes, or from less advantaged homes (where the head of household was unemployed, or where parents claimed means-tested benefits, or where the mother had a low education level): carotene, niacin and vitamin C were consistently lower. Children from lone-parent families had lower levels of carotene and vitamin C, particularly if there was more than one child in the family. Similarly, children in manual households, or those receiving benefits, had lower intakes of iron, calcium, phosphorus and potassium. There were no significant differences in energy intake by any socio-economic characteristic (Gregory *et al.*, 1995). In the study on diets of school children, those who received free school meals (and were therefore from households in receipt of benefits) had lower vitamin and mineral intakes than those not from benefit households (DH, 1989).

In the Scottish Heart Health Study of 10,000 men and women, dietary intakes were assessed using a food frequency questionnaire. Those in manual social classes had higher energy intakes, but lower intakes of carotene, vitamin C, vitamin E, and fibre than those from non-manual classes, even when the data were controlled for smoking (Bolton-Smith, Smith, *et al.*, 1991). The 36-year follow-up to the 1946 national birth cohort study used a seven day diary to assess nutrient intakes in 2,400 men and women. Intakes of cereal fibre, calcium, iron (in women) and vitamin C, were all significantly lower in social classes IV and V, among unemployed men, and for men and women with low educational achievement levels (Braddon *et al.*, 1988). A survey of nutrient intakes from N Ireland found similar nutrient differences by occupational social class (Barker *et al.*, 1989).

These findings from large surveys are comparable to those from smaller surveys looking at nutrient intakes in different age groups, and in households of different socio-economic circumstances (e.g. Nelson and Naismith, 1979; Doyle *et al.*, 1982; Cade *et al.*, 1988; Schofield *et al.*, 1987 and 1989; [in Dublin] Lee, 1990; Moynihan *et al.*, 1993), including the homeless (e.g. Rushton and Wheeler, 1993). Some of these

surveys used employment status or educational level to characterize socio-economic status; most present actual nutrient intakes rather than adequacy.

Turning to indicators of food patterns, the majority of the national surveys mentioned above, and most smaller-scale surveys, report a wide disparity in the type of foods people eat according to their socio-economic status. Surveys which used occupational social class may partly be reflecting class based behavioural differences in meal and eating patterns. However, such historical and cultural differences cannot fully account for the differences seen. First, populations of the large cities contain ethnic minorities who are not evenly distributed between occupational groups: a larger proportion are found in manual or semi-skilled occupational groups than skilled or professional classes. Asian and Afro-Caribbean or black British food and meal patterns are very different from the traditional white working class eating patterns (S. Sharma, personal communication). If "manual" class groups eat less fruit than "non-manual" it is not just because the former are white working class; there must also be an income effect. Secondly, surveys which use employment status of household head, or receipt of means-tested benefits, or family size/number of dependent children, as socio-economic indicators, none of which completely match social class, report patterns of food and eating in less affluent households similar to those obtained by using occupational social class.

In the NFS for instance, higher income households bought almost twice as much fruit per week as lower income households but ate fewer cereals (including bread) although they spent more on cereals (MAFF, 1994a). Poorer households consumed three times as many white, standard loaves as did richer households, almost twice the quantity of potatoes, but only a third of the quantity of fruit juice. In the ANS men and women of higher occupational classes were more likely to eat recommended foods such as fruit, vegetables and salads, oily fish and polyunsaturated margarine, though also dairy products, buns, cakes, pastries and chocolate, than those from lower occupational classes (MAFF, 1994b). Similar patterns were observed in the PSNS: children from non-manual households were twice

as likely to consume fruit juice as those in the manual, who tended to consume tea (Gregory *et al.*, 1995). A number of investigators have looked at "healthy" dietary patterns and occupational class; a common finding is that those from non-manual or higher income households, who are non-smokers, and particularly women, have healthier eating patterns (e.g. Bolton-Smith, Brown *et al.*, 1991; Whichelow *et al.*, 1988; Anderson and Hunt, 1992; Abel and McQueen, 1994). In practice, few authors disentangle the social and cultural element from income per se, nor from the demoralizing impact of poverty on self esteem and personal care.

The rest of the chapter summarizes the common ground between nutrition and the poverty debate.

Nutrition and poverty review: a) nutrition as a component of poverty lines

Those who try to define and measure "absolute" poverty use nutritional concepts to identify a minimum diet as component of basic needs. Economists in particular have used nutritional science as justification for minima, usually for poverty datum lines or minimal cost of living statements (Reutlinger and Selowsky, 1976; Dandekar, 1981; Scott, 1981; Sukhatme, 1981; Lipton, 1982; Mehta, 1982; World Bank, 1986). Essentially, a minimal nutrient intake (in the most basic versions, of calories alone) is defined, usually as an average for a population, and quantities of foodstuffs to supply such a daily intake calculated. These foodstuffs are costed, and an allowance is added for additional basic needs costs (housing, clothing, fuel, etc). Alternatively, assumptions are made about the proportion of income spent on food, and the theoretical cost of minimal food is scaled up accordingly. The result is used as a minimal cost of living, or absolute poverty datum line.

The figures obtained are notionally objective in that they use scientific criteria of minimal requirements for survival, rather than observing what people living on low incomes actually purchase, which has the potential for including elements of "human inefficiency". In fact, this objectivity is spurious; there is no minimal universal standard for energy intake or any nutrient; as described above, most requirement

figures in current use are probability statements about the likelihood of avoiding deficiency if a given amount is consumed, and the levels chosen are subject to controversy (Smith, 1995). The choice of cut-offs for energy needs depends what basis of body size and activity is used (Payne, 1992, among others)⁵. There is also no objective standard for sources of nutrients - no-one eats a diet devised by a least-cost analysis program (Henson, 1991); no-one eats a diet costed at theoretical minimal prices (Walker and Church, 1978). Controversy over the choice of cut-offs (in India and in the UK) and the nature of the model on which measurement is based has long been documented (e.g. Woolf, 1946; Srinivasan, 1977; Sukhatame, 1981; Payne and Cutler, 1984; Veit-Wilson, 1986; Osmani [ch5], 1992). Payne and Cutler (1984) in particular, illustrate the implications of different conceptual models for the definition and measurement of nutritional problems, and for intervention objectives and practice, which they ally to ideological differences. The debate, which is reminiscent of some in the 1920's and 1930's in the UK (Petty, 1987) is elaborated in some detail by the main protagonists in the WIDER review of nutrition and poverty (Osmani [ed], 1992). The central issue of whether optimal states of nutritional wellbeing exist, and the implications for measuring either caloric or anthropometric shortfalls as proxy indicators thereof, remains unresolved.

Seebom Rowntree was probably the first to use ideas about requirements in a systematic way to define a minimal subsistence cost of living or poverty line. As Veit-Wilson makes clear (1986), Rowntree did not use this poverty line to *identify* who

⁵ Many attempts to measure poverty internationally, and/or hunger and food deficits, concentrate on energy intakes alone, on the assumption that they represent the basic need. There are a number of problems with these approaches. First, measurement of energy intake other than by individual or household dietary survey of some kind is unreliable; food balance sheet estimates are not a measure of energy consumption, merely a guesstimate of availability or supply (Dowler and Seo, 1985). Unfortunately, many commentators make use of FBS either as source of energy data, or to modify models used to estimate energy intakes from household food expenditure surveys (e.g. Reuthinger and Selowsky, 1976; World Bank, 1986.) Secondly, it is difficult to interpret low energy intakes; requirement distributions for energy are either based on the distribution of intakes observed in a supposedly healthy population, or from factorial measurement of energy expenditure components (FAO/WHO/UNU, 1985). As Payne argues, the latter requires the user to specify average body weight and activity level for the population in question: objectivity is again illusory (should the levels of weight and activity specified be desired optima or based on observations in the population concerned?). Thirdly, of course, people need more than energy; obtaining a suitable diet may cost more than obtaining basic energy needs.

was poor - that was done visually and on a relative poverty basis (comparing the living conditions of working class people in York with living conditions conventionally recognised and approved). The poverty line was used to separate people identified as poor into those whose income was insufficient to purchase basic survival necessities, and those whose income was sufficient but who were unable so to do for other reasons (not necessarily inefficiency). Rowntree deliberately chose a diet so economical and unattractive that none should accuse him of setting too high a nutrition standard and therefore too generous a poverty line⁶. It was others who translated this minimal for survival into that on which people who "budgeted properly" could be expected to live - i.e. the rates used for national subsistence (Woolf, 1946; Walker and Church, 1978).

Food budget standard calculation (e.g. Nelson *et al.*, 1993), or food costing exercises, have sometimes been used in the UK as a way of measuring the likelihood of "nutritional deprivation" as a component of poverty (e.g. Stitt and Grant, 1993; Leather, 1995). These are similar in principle to minimum poverty lines in that theoretical diets or "food baskets" are constructed, either to meet minimum nutrient requirements, or to match recommendations for "healthy dietary patterns", or both. There is no established principle whether a diet should reflect actual practice of food choice and preparation, or should be based on some notional "ideal" of budgeting and meal preparation, or even ignore meal patterns altogether: a "least-cost-diet" (as in Henson, 1991; MAFF Food Science Division, 1992). In costing such diets no conventions exist over choice of price data, uprating, and assumptions for additional costs. Obviously dietary costings only provide an indication of potential nutritional deprivation for a household, rather than what is actually occurring, nor who within the household is bearing the brunt of any shortage. These issues and the choices made by different research groups are discussed in Dowler and Rushton, 1994.

⁶*"My primary poverty line represented the minimum sum on which physical efficiency could be maintained. It was a standard of bare subsistence rather than living [italics in original]. The dietary I selected was more economical and less attractive than was given to paupers in work houses. I purposely selected such a dietary so that no one could possibly accuse me of placing my subsistence level too high."* (B.S. Rowntree, 1941, Poverty and Progress. London: Longmans Green, p102; quoted in Veit-Wilson, 1986)

Nutrition and poverty review: b) nutrition as a contribution to poor health outcomes

In the last decade, a growing public health literature has documented close links between poverty or low socioeconomic status, and differential morbidity or premature mortality, in the UK and other European countries, in the US and Australia (e.g. Townsend *et al.*, 1982; Marmot and McDowall, 1986; Whitehead, 1987; Davey Smith, Bartley and Blane, 1990; Wilkinson, 1992; Dowler, 1993; Svenson, (editorial) 1993; Marmot, 1994; Sloggett and Joshi, 1994). These differentials are particularly common for the leading causes of mortality in the UK, coronary heart disease and cancers, and they have been widening as income inequality and deprivation have increased during the last decade and a half (e.g. McLoone and Boddy, 1994; McCarron *et al.*, 1994; Phillimore *et al.*, 1994). Some of the research uses occupational social class as socio-economic indicator (in adulthood: e.g. Goldblatt, 1989;

Wing, 1988; Harding; 1995; in childhood: Bartley *et al.*, 1989; Gliksman *et al.*, 1995; or both: Lynch *et al.*, 1994). The Whitehall studies on morbidity and mortality of civil servants used employment grade (Marmot *et al.*, 1978; Rose and Marmot, 1981; Davey Smith, Shipley and Rose, 1990). Many other studies use deprivation indices, either associated with residence (Haan *et al.*, 1987; Carstairs and Morris, 1989; Ben Schlomo and Davey Smith, 1991; Eames *et al.*, 1993; McLoone and Boddy, 1994; McCarron *et al.*, 1994; Phillimore *et al.*, 1994) or with the individual (Sloggett and Joshi, 1994). Several authors focus on unemployment in particular for its association with poor health and higher mortality (Arber, 1987; Moser *et al.*, 1987; Crombie *et al.*, 1989; Morris *et al.*, 1994). Wilkinson (1992, 1994a, 1995a), examines the association with income and, among others, argues that rising inequality of income, and relative rather than absolute poverty, is associated with the rise in morbidity and mortality among those who are poorer.

A number of authors discuss explanations for these differentials (among them, Townsend and Davidson, 1982; Macintyre, 1986; McLoone and Boddy, 1994; Harding, 1995; Fox and Benzeval, 1995). They conclude that artefactual distortions or social selection, although important in some instances, are insufficient to account for the magnitude of the differences seen, and that social causation or materialist factors

partially mediated by life circumstances, beliefs, attitudes and values, and behaviour, offer plausible explanations and potential for intervention. Davey Smith, Blane and Bartley have twice reviewed explanations for health inequalities between social groups, each time calling for more attention to be paid to materialist explanations in research (1990; 1994). The MRC-funded prospective study of everyday life and health in three age cohorts in Glasgow (Macintyre *et al.*, 1989) sought explicitly to attempt to disentangle structural/materialist and behavioural/lifestyle factors as explanations for Glasgow's marked health differentials, rather than seeing them as mutually exclusive. The recent Economic and Social Research Council new programme on health variations is a further initiative designed to elucidate some of the causal or mediating pathways and potential for intervention.

Most studies have linked mortality and socio-economic indicators at electoral ward level or above, not at the individual level (indeed, very few studies have used household income *per se*). A recent exception is work by Sloggett and Joshi (1994), who looked at mortality by a deprivation score based on census data which they then adjusted for personal socio-economic indicators known to be associated with low income (e.g. rented housing and no car access). They showed that similarly disadvantaged individuals had higher mortality risks wherever they lived, and that higher death rates in areas identified as "deprived" by census variables occur because a disproportionate number of disadvantaged people live there. The authors argue that personal income makes the crucial difference to mortality, but do not explore what it is that income can, or cannot purchase, or what else it might signify, to account for the reduced life expectancy.

Davey Smith, Blane and Bartley go further in concluding: *"[...] social structure leads to the clustering of advantage or disadvantage [...which] also occurs over the course of a life. A woman in a low-income household is more likely to be poorly nourished during pregnancy and to produce a low birth weight or premature baby. A child growing up in a low-income household is more likely to be disadvantaged in terms of diet, crowding, safe areas in which to play and opportunities for educational*

achievement. An adolescent from a low-income household is more likely to leave education at the minimum school leaving age, with few qualifications and to experience unemployment before entering a low-paid insecure and hazardous occupation, with no occupational pension scheme. An adult working in this sector of the labour market is more likely to experience periods of unemployment, to raise a family in financially difficult circumstances and to retire early [....] A retired person who does not have an occupational pension is more likely to experience financial deprivation in the years leading up to their death." (Davey Smith, Blane and Bartley, 1994, p140).

Before the MRC and ESRC initiatives, government and research attention focussed on factors which were described as behavioural: smoking, exercise and diet (e.g. Whichelow *et al.*, 1991). People who were poor were said to eat the wrong things, smoke too much and exercise too little (although controlling for smoking in epidemiological studies does not remove social class or deprivation related mortality risk; e.g. Davey Smith, Shipley and Rose, 1990). Research in the social policy arena sought to locate behaviour in its social, economic and political context, rather than as solely an aspect of individual, atomistic choice (e.g. Graham, 1993; Cole-Hamilton and Lang, 1986; Dobson *et al.*, 1994; Marsh and McKay, 1994).

The materialist versus behavioural controversies have a long history (e.g. Petty, 1987), but seem to have come into focus again recently in part because of "health promotion" and "lifestyle" arguments (Nettleton and Bunton, 1995); resolution sometimes seems unlikely (Le Grand, 1994). The role of diet is one of the central issues, and whether or not people can afford to purchase and eat a healthy diet, as opposed to whether or not they know or choose to do so, has been controversial for many years^{7,8}. There is

⁷*"That the diet of the poorer London children is insufficient, unscientific, and utterly unsatisfactory is horribly true. But that the real cause of this state of things is the ignorance and indifference of their mothers is untrue. What person or body of people, however educated and expert, could maintain a working man in physical efficiency and rear healthy children on the amount of money which is all these same mothers have to deal with? It would be an impossible problem if set to trained and expert people. How much more an impossible problem when set to the saddened, weakened, overburdened wives of London labourers?"* M. Pember Reeves, 1913, Round About a Pound a Week, London: G.Bell&Sons, Ltd; reprinted 1979, London: Virago, p145.

debate over how much money is needed to buy and prepare a "healthy" diet (Cade and Booth, 1990; Nelson *et al.*, 1993) and whether or not state benefits for instance are sufficient to enable recipients to afford such a diet (e.g. MacDonald and Forsythe, 1986; Hanes and MacDonald, 1988; NCC, 1992, Annex 1; Leather, 1995).

NFS data show that high income and childless households spend more money on food, but poor households spend the highest proportion of income on food (Hobbiss, 1993; MAFF, 1994a); in 1993, about £8-9 per head to feed their family for a week. (In fact, rather less than either MAFF or a leading supermarket chain recognize: MAFF simulated a low income "healthy dietary pattern" for £10 per head per week (Leather, 1992), and Sainsbury's costed a week's food for a low income family of four that met health guidelines at £11.66 a head (Erlichman, 1994)). In general, NFS data indicate that household composition has a greater influence on food expenditure than income, except for the poorest groups where there is little difference in average weekly spending per head between households with different numbers of children (MAFF, 1994a). The data also show that the poorest households buy foods which are the best value for money for nutrients, and buy more of basic food items such as bread, fats, potatoes and sugar.

There is evidence that a varied diet as recommended in current "healthy" eating advice is more expensive than a monotonous "unhealthy" diet, if real, typical diets are costed using the shops poor people have access to (Mooney, 1987; Morton, 1988; NCH, 1991; Sooman *et al.*, 1993; Hollington and Newby, 1995). Interview studies have highlighted how hard it is for poorer households to choose "healthy" diets or to remain in the mainstream of food choice and dietary patterns, and the stress that is induced, particularly for women, meeting the food demands of a family on a limited budget. (These studies are reviewed in Dowler and Rushton, 1994; see also Graham, 1993;

⁸ There is also controversy over the role of adult "lifestyle" factors as opposed to early life experience in causing premature mortality from coronary heart disease and respiratory infections (e.g. Barker and Martin, 1992; Elford *et al.*, 1992). This thesis does not address these controversies (see Dowler, 1993), nor the role of maternal nutrition in foetal development and subsequent morbidity and mortality in adulthood.

Dobson *et al.*, 1994).

nutrition and poverty review: c) poverty as a cause of poor nutrition

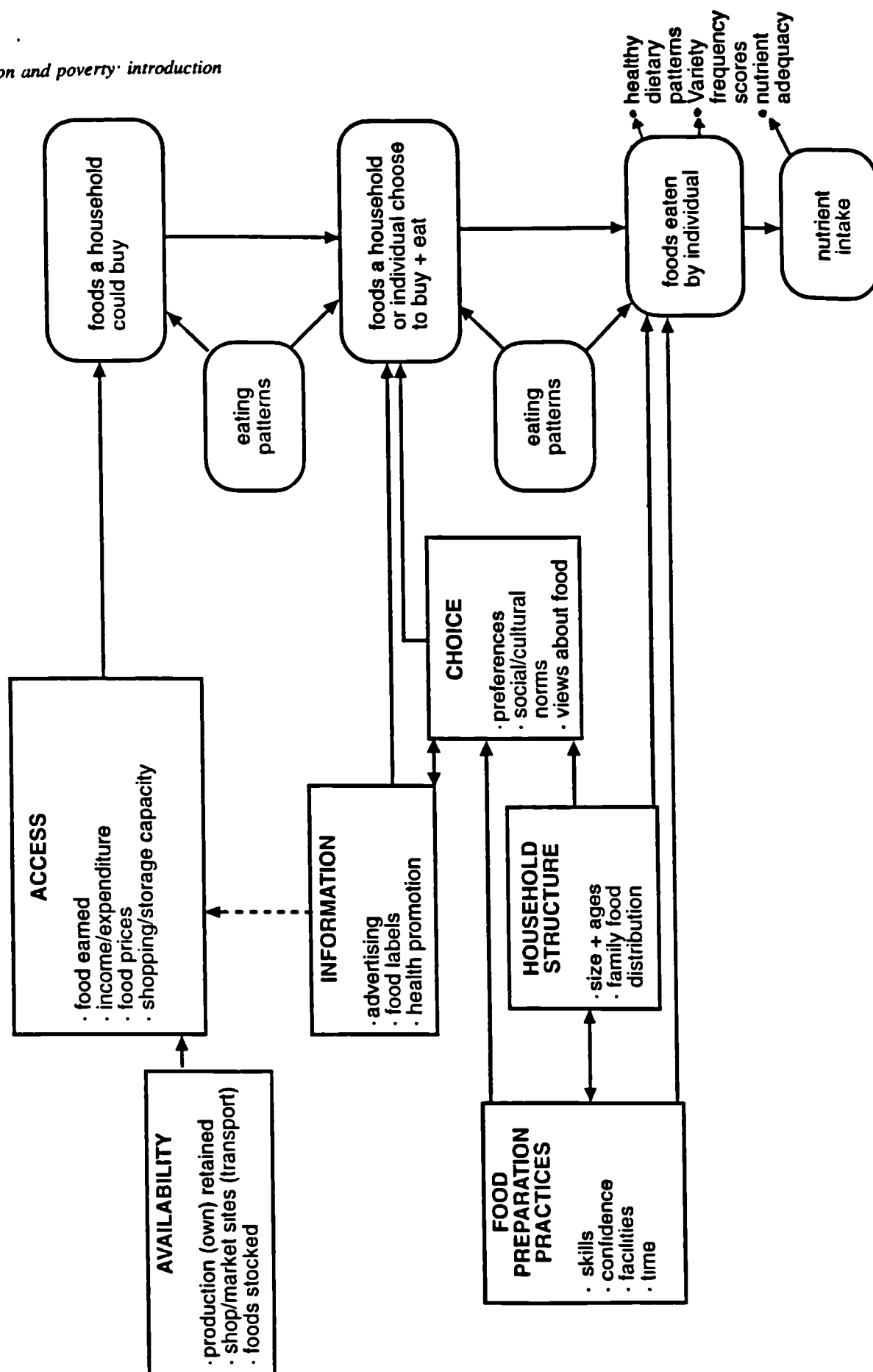
"Food is the only place I find I can tighten up. The rest of it, they take it before you can get your hands on it really. So its [sic] the food... The only thing I can cut down on is food because I use as little heating as I can and I don't smoke."

(Low income lone mother, quoted in Graham 1986, p61).

Poverty, however defined, has consequences for food intake. As figure 1.1⁹ illustrates, individuals' nutrient intakes, indices of food variety and diet patterns can be used as outcome indicators of a household's entitlement and general access to food (Sen, 1981; Pacey and Payne, 1985). Access in non-industrialized countries includes food production or procurement (e.g. through own production, share-cropping or labour paid in kind). In a country such as the UK it also includes effective demand: the amount of money a household or individual allocates to food expenditure, which in turn depends on how much money they have and how they balance competing expenditure demands. Access is also determined by where and what kind of shops people can reach, the price of foods, and the range of food commodities on offer: there is an obvious link to availability. The foods a household chooses to buy depend on access plus individual tastes and skills, which might be influenced by official and commercial information. Intrahousehold food allocation additionally determines who gets what. Poor households probably have fewer choices open to them than richer, and may use a number of options to manage a limited budget. "Coping strategies" is a term sometimes used to describe the various ways by which people either adapt their expenditure to match their income, or expand their income to meet their actual expenditure as a means of trying to contain poverty. "Failure to cope" can result in a debt crisis. It can also lead to adjustment of food intake and choice to levels which result in nutritional deprivation for some or all individuals in the household, with consequences for their health, well-being and survival.

⁹Figure 1.1 is developed from the figure in Williams and Dowler (1994) and in DH (1996, in press), which in turn was based on a series of figures produced during the analysis of the empirical data for this thesis, but not published in Dowler and Calvert, (1995).

figure 1.1 food access + nutrition outcomes



A number of studies in Britain have used qualitative approaches to investigating the effect of low income on food practices. Many interviewed described food as a flexible budget item where economies could readily be made, though most said these would be in their own diets, particularly mothers, rather than their children's (e.g. Lang *et al.*, 1984; Graham, 1986; Mack and Lansley, 1985; Cole-Hamilton and Lang, 1986; Milburn *et al.*, 1987; HEA, 1989; Malseed, 1990; McKie & Wood, 1991; Dobson *et al.*, 1994). Other areas of expenditure are of necessity regarded as fixed costs, and many low-income households try not to fall into arrears in paying them. People describe economizing on food either by buying cheaper or different items ("filling" foods rather than fresh fruit) or by omitting meals altogether in order to meet some pressing bill or financial demand. People had developed great skill in cooking acceptable meals from few ingredients, with imaginative use of the store-cupboard or home grown food; people also borrowed food or money for food. When economies were made in the food budget, consumption of fresh fruit, fresh good quality (lean) meat, cheese and fish declined, and that of the cheaper foods - eggs, beans, cheap meats and chips - increased (Lang *et al.*, 1984; Malseed, 1990; Dobson *et al.*, 1994).

Poverty is now widely recognized as a major cause of nutritional deprivation or malnutrition among those who work in international nutrition (Pacey and Payne, 1985; Osmani, 1992; FAO/WHO, 1992¹⁰; Hopkins, 1993), but until recently this view was less readily accepted in contemporary Britain. Rivers argues that until the late nineteenth^{century} *"the cost of subsistence was regarded as the major determinant of nutritional status"* (Rivers, 1979, p228). As Rivers (1979), Petty (1987) and Smith (1995) among others describe, poverty as cause of poor nutrition was documented by researchers throughout the twentieth century, but its role was seldom accepted by those responsible for policy and intervention. There was public furore following publication of Boyd

¹⁰ "We recognize that poverty and lack of education .. are the primary causes of hunger and undernutrition. There are poor people in most societies who do not have adequate access to food, safe water and sanitation, health services and education, which are the basic requirements for nutritional well-being.. In addition nutritional well-being is hindered by the continuation of social, economic and gender disparities.." taken from: World Declaration and Plan of Action for Nutrition, submitted to the International Conference on Nutrition, in Rome, December 1992, by the Ministers and Plenipotentiaries representing participating States and the EEC.

Orr's seminal Food, Health and Income (1936); as a result, and through Boyd Orr's personal intervention, the wartime food rationing was based on principles of equity rather than food purchase: *"a rationing system and social policy which became the envy of the world"* (James, 1994, p29; personal communication). There has been little systematic research specifically on nutritional deprivation among low-income groups in the UK since then. The field study for this thesis was among the first explicitly to address whether poorer people, however their poverty be defined, eat adequately or not; whether and how poorer households' food purchases are constrained by access; and the consequences of poverty coping strategies for nutritional wellbeing.

Nutrition and poverty review: d) poor nutrition as an aspect of deprivation

"It is not sufficient to assess poverty by absolute standards; nowadays it must be judged on relative criteria by comparison with the standard of living of other groups in the community. [...] beneficiaries must have an income which enables them to participate in the life of the community."

(Linda Chalker (then) Minister for Social Security, House of Commons, 6th Nov 1979)

As figure 1.1 illustrates, food intake and an individual's nutritional status represent the outcome of a process of food production and procurement, budgeting, and allocating time and expenditure to particular commodities and to health care to meet social and cultural needs, as well as physiological demands. Food is the meeting place - often literally - of social exchange in society and within families. The discussion of nutritional deprivation indicators above showed that, although some indicators (such as the LRNI) are based on lowest, survival cut-off points, the majority are informed by social norms and expectations. The distribution of energy requirements is based on observed distributions of energy intakes in free-living, presumed healthy populations. Reference intakes are judged sufficient to meet the needs of most people. Indicators of variety or "healthy" dietary patterns are predicated on the poor being as entitled to a healthy long life as anyone else. In addition, although the social exchange of food is largely unquantifiable, there is a general acknowledgement that poor people should be able to celebrate festivals and engage in social occasions.

Nutritional deprivation is therefore as much a part of general deprivation as any other:

that people *"lack the types of diet, clothing, housing, household facilities and fuel, and environmental, educational, working and social conditions, activities and facilities which are customary, or at least widely encouraged and approved, in the societies to which they belong"* (Townsend, 1979, p413). Indicators of nutritional deprivation contribute to "direct" measurement of poverty (Ringen, 1987) i.e. a standard of consumption or level of living so low it excludes those who suffer it from the normal way of life. Ringen argues that poverty should be measured not by counting households or people with insufficient income, but by counting those experiencing the deprivations concerned. Callan and colleagues (1993) in operationalizing these ideas, used an Irish data set to explore the relationship between income and deprivation indices to identify the poor - those excluded from their society due to lack of resources. Food indicators which figured among "necessities" identified by survey respondents were: to be able to have a meal with meat, chicken or fish every other day; to be able to have a roast meat joint once a week; not to have had a day during the previous fortnight when the respondent had had no substantial meal; and whether the household had had to go into debt in the past year to meet ordinary living expenses, including food. Townsend also constructed a deprivation index from Londoners' views of "necessities"; the dietary deprivation index included: having had at least one day in last fortnight with insufficient to eat; no fresh meat or fish most days; no special meat or roast most weeks; no fresh fruit most days; short of food at least once in last 12 months to meet a family member's needs (Townsend, 1987). Mack and Lansley (1990) asked their survey respondents whether they agreed items were "necessities" and constructed a deprivation index from their responses. Not being able to provide three meals a day for children or two for adults; not having fresh fruit; and not having a meat, fish or vegetarian dish every other day, were deemed "necessities" by more than 77% of interviewees, and were among the first 16 ranked criteria of deprivation.

The deprivation indexes used here are different from those in epidemiological surveys described above, where indices based on indicators such as dwelling crowding, lack of a car, occupation or unemployment, (sometimes) income, were constructed from

census data. The epidemiological deprivation indices use no food or diet based indicators, although there are parallels in approach. This thesis explores the contribution of quantified food and nutrition indicators as indices of deprivation.

Summary:

This chapter has reviewed the literature and practice in defining and measuring the extent of poverty and nutrition deprivation in the UK. Quantitative and qualitative evidence has been presented that nutritional concepts have been used to define poverty lines; that dietary factors probably contribute to poor health outcomes and premature mortality; that poverty contributes to poor nutritional conditions in the UK; and that food indicators have been used to some extent in definition of deprivation and relative poverty. The next chapter focuses on policy: in general and as applied to nutritional issues.

Chapter 2 NUTRITION: THE POLICY ARENA

"Malnutrition is a problem that defies pat solution. It has many roots [...combining] in different ways over time and place [...and] often aggravated by uncertain political commitment. [...] Adding to the complexity is the lack of organizational locus for carrying out [...] programs, because nutrition is not a sector in the conventional sense."

(Alan Berg (1987) Malnutrition: What can be done? Lessons from the World Bank Experience. Baltimore: Johns Hopkins University Press, for the World Bank)

Policy in the food and nutrition arena

The definition of "policy" is controversial. It can range from a simple statement of intention (as in "Health for All by the Year 2,000") to the actual action: what happens in terms of institutions and outcomes. Ritson defines it as *"an action or set of actions taken by government to modify some aspect of the economic or social system in order to attempt to achieve certain objectives [...] a conventional distinction between policy objectives and mechanisms is maintained"* (Ritson, 1983, p260). Policy is also seen as a series of decisions and their implementation, or as these plus the consequences (Walt, 1994). The public servant's answer is usually that policy is what ministers want (Wiseman, 1990¹): the political nature of bureaucratic processes is thus made explicit. In general, the policy process is usually described as consisting of problem definition, setting objectives and targets, allocating resources, and creating institutions and instruments to meet objectives. These activities have various effects or impacts - in the present instance, on food and nutritional outcomes. Such outcomes may be direct (more food/ better food/ safer food) or indirect (children grow better/ faster/ bigger; prevalence of obesity declines; prevalence of, or excess mortality from, nutrition related diseases is reduced). Outcomes related to consumer choice (people enjoy a wider range of foods) are not usually seen as appropriate for nutritional intervention. Outcomes such as increased household resources through provision of

¹"Policy on any issue in a Government Department is determined by Ministers. Each Government is elected at a General Election [...] there will be little doubt [...] about the general philosophy of the Government that has been elected, and of its specific intentions in a number of areas. [...] it is understood that the general philosophy of the Government will apply to those areas [which have not been debated] as much as any other. Consequently, nutrition policy [...] is determined in the light of a philosophy directly determined by the outcome of the electoral process. [...] Ministers decide on policy in the light of advice [on practical details]." Wiseman (1990) p397.

Nutrition: the policy arena

food (rather than nutrient intakes of individuals), or disposal of surplus food, are also not always treated as legitimate nutritional goals (Hopkins, 1993). In practice it is hard to demonstrate simple cause and effect between nutrition or food intervention inputs, however widely defined, and the corresponding indirect outcomes; policy evaluation or prioritization of interventions is therefore hard.

Policy in relation to nutrition is essentially intersectoral, and usually falls under the remit of health and agriculture, although social and employment policies and the private sector food industry also have important roles. In its broadest sense, policy in nutrition should be concerned with individual or household access and entitlement to sufficient healthy food; to a healthy environment; and/or (if indirect outcomes are considered) to appropriate health services (see figure 1.1 in chapter 1). Policy areas potentially include: national and local food supply, cost and safety; consumer choice, including nutrition information and food labelling; livelihood security and incomes and, indirectly, household decision-making about allocating resources; socio-economic factors such as cooking facilities, access to clean water, fuel etc; and access to health services. Policy activities have also included monitoring and surveillance: systematic measurement and assessment in relation to intervention and policy decision-making.

Policy in the nutrition arena is certainly a focus for struggle among competing interests to influence government behaviour (Petit, 1993; Smith, 1991). In general, one could identify a number of interest groups who operate at both national and international level. Broadly speaking, they tend to fall into consumer groups; producers or suppliers (farmers, processors, distributors, ^{retail and} the food industry); and the scientific and medical communities, with different flows of information and influence (Payne and Thomson, 1979). In addition, there are pressure or lobbying groups who represent any one of the above, and some, such as organizations like OXFAM, who possibly represent

"consumers", but of a particular kind (the marginalized/ disenfranchised)². Pinstруп-Andersen (1993) identifies three groups of key actors in a given country: households and groups who represent them; public-sector agencies, which includes the state decision-making and executive bodies; and private sector agents - producers, processors, distributors, exporters and importers. He therefore distinguishes the public and private sectors, with households outside, or different from, both. He omits the scientific or medical community operating in academic and other public or private institutions (curious in one who has headed a nutrition group in a university and is now director of an international research institute): a serious omission because public sector agencies rely on "committees of experts" drawn from this community (internationally and nationally) to provide consensus statements of nutrient and growth reference levels (Smith, 1995), and to pronounce on nutritional aspects of medical problems (e.g. DH, 1994a). These published statements are used as a basis for policy formulation, and sometimes contain explicit policy targets (e.g. DH, 1994a). In practice, the scientific nutrition arena is one of divergence rather than consensus at the international and national levels, over setting scientific reference values, the causes of malnutrition, and therefore over appropriate responses (Harriss and Payne, 1984; Wheeler, 1985; Payne and Cutler, 1987; Berg, 1987; Osmani, 1992; Smith, 1995). The controversies seldom work their way through to policy intervention (Petty, 1987; Osmani [ch5], 1992).

The general public or consumer pressure for change addresses a huge range of issues: from advice on the type of diet to eat to avoid undesirable outcomes (such as a second heart attack) to long term safety of food production and preservation techniques (British examples include genetic engineering, potential for interspecies transfer of

²At the recent FAO/WHO International Conference on Nutrition, held in Rome in December 1992, for national delegations only, representatives of the food industry were categorized with groups like OXFAM as "non-governmental organizations" (ngos), initially with limited powers to contribute and intervene. The UK delegation had a representative of "UK Food Groups", which included ngos such as HelpAge International, Christian Aid and Save the Children UK, and also some farmers' associations (S. Ismail, personal communication). The Food and Drink Federation, the British Nutrition Foundation and the National Food Alliance also had representatives in the UK delegation. Few other government delegations included ngos.

slow acting prions [the BSE controversy], or effects of pesticide residues on health) to consequences for the natural environment or animal rights (e.g. monocropping, or the transport of veal calves). Significantly, consumer generated pressure for the poor to be able to eat healthily has been less visible, either from lobbying groups, or from the poor themselves. Notwithstanding, Hopkins (1993), drawing on examples from post-industrialized, newly industrialized and non-industrialized countries, identifies an increase in (lobbying or political) power of undernourished groups as one of three basic conditions under which nutrition goals get on the action agenda. He identifies the other two as famine or acute food shortages, and new scientific understanding of the relation of food to health and economic productivity.

In fact it is not clear how issues get on to the agenda in either public or private sectors. Hopkins (1993) highlights the need for more research on the changing role of nutrition on the political agenda, and on policies as intervening variables between interests and outcomes; Milio (1989) and Dowler and Wood (1990) similarly called for more attention to the process by which nutrition problems are constructed in public agencies, and how priorities for information and implementation are established. It is said that internally generated demands are made on government through the workings of nutritional surveillance systems, or through internal pressures from the bureaucratic hierarchies and political elements of the government machine. Whether surveillance ever truly generates internal demand *de novo* is a moot point. On the one hand, policy initiatives in the UK to address increasing levels of obesity have arguably arisen from results of surveillance. On the other, the international community has long promoted nutritional surveillance as a legitimate activity for policy units, but the focus has been on technical aspects of nutrition information provision, rather than what decisions could or should be affected by critical nutritional information and how to provide it. There is little evidence such surveillance has effected any policy outcomes. The premise has presumably been that policy proceeds by the rational process outlined above, beginning with problem definition based on objective information. An alternative perception that policy is the forum for and outcome of competing interests would need the political nature of information provision to be made explicit, with the underlying paradigms of problem identification used by those making the measurements. For

Nutrition: the policy arena

instance, where nutritional problems are seen as occurring randomly within the population, random surveys as a basis for the information system are appropriate. Where nutritional problems are acknowledged to occur within particular livelihood groups, or geographical regions, purposive sampling techniques would be used. (Most national surveillance systems use the former approach.)

the goals of "nutrition" policy

The goals of policy in the nutrition arena might be supposed relatively unproblematic: as "housing policy" ultimately addresses issues of access to, and mechanisms for provision of suitable affordable housing for citizens (though there might be debate over and shifts in what form "suitable" might take), so "nutrition policy" should address issues of access to, and mechanisms for provision of suitable, affordable food. In some instances, it does just that. But in reality, access, in terms of effective demand, and management of shops, markets and pricing, is usually the domain of sectors or divisions who would not regard themselves as having to do with nutrition, unless as part of welfare provision (as in subsidized food, or implementation of a food stamp scheme). Likewise, those engaged in food production, import, storage, transport, distribution, hygiene, safety, marketing, etc, would acknowledge the general importance of foodstuffs in meeting nutritional needs, but would not see themselves as actors in or components of nutrition policy (Dowler and Wood, 1990; Hopkins, 1993). The boundaries of nutrition and its legitimate concerns are hard to define (Ritson, 1983; Smith, 1991). (Even the role of nutritionists has been contentious: the discipline has regularly been ignored by international and national agencies and institutions, who often employ "non-nutritionists" (i.e. those without any formal training in nutrition) to do essentially nutritional tasks (Rivers, 1979; Smith, 1995)³.)

³In the UK, the Nutrition Society would like to see itself as a professional regulating body, although it does not formally have that role. It has been involved in a protracted, tangled argument over definitions; first, of "nutritionists" in order to set up a formal Register of Accredited Nutritionists through the Institute of Biology; and latterly, of "public health nutritionists", to provide accreditation or recognition for those who want to work in such an arena, not least in primary health, particularly to meet demand generated through *Health of the Nation*. A year's post has been created at the University of Southampton, under supervision of a member of the Nutrition Society's Council, from September 1995, to explore and report on the formal definition, role and legitimate expectations of a "Public Health Nutritionist".

By and large, nutrition as understood and practiced in much of the twentieth century is located either in "welfarism" or in "investment need" as a basis for intervention (Dowler and Wood, 1990). These two approaches - which need not be mutually exclusive - are well illustrated in Petty's account (1987) of nutritional concerns penetrating the public agenda both at the beginning of the century (where nutrition was an essential part of producing men (*sic*) capable both of defending the empire and working productively to further it) and during the 1930's (where nutrition was perceived as a widespread problem among the poor, and formed part of the campaign for raising benefit levels [particularly as result of Boyd Orr's work]) (see also Murcott, 1995b). Similarly, several authors in the recent collection on the political economy of food and nutrition from the International Food Policy Research Institute (Pinstrup-Andersen, 1993) describe nutrition's dual basis for attention: as a cost-effective means of redressing adverse consequences of market failure, or as part of improving human productivity. Nutrition as a component of social justice or human rights is seldom a reason for getting on the agenda.

These generalizations about why nutrition matters lead to policy responses based on a framework of assumptions which match the reasons for investment. Considering first the "welfarist" approach; this is based on assumptions of poor entitlements and/or nutritional (or housekeeping) ignorance or illiteracy; a further division is sometimes made between those who cope and those who do not, with overtones of the deserving and undeserving poor. These assumptions produce causal explanations which range from the structural to the pathological. State intervention includes creation of food or service delivery agencies; education or extension services; institutions to improve access to food or its entitlement (through e.g. food stamps); provision of minimum income to avoid destitution, within which sufficient money for food is notionally guaranteed by scientific calculations; and so forth. Wood (1985) identifies the process of labelling (people, rather than food, in this instance) and targeting as essential to these practices; since policy is the corollary of scarcity, labelling is the necessary condition of public management of scarcity (Wood, 1985, p9). The state designates those who deserve or are entitled to welfare intervention; labelling reinforces the

"relationship of power" (Wood, 1985, p11). As Wheeler states (1985, p481) *"although a label may be one obvious and factual way of describing a person or group, its choice and use simultaneously obscure and facilitate the processes by which access to scarce and important resources are controlled"*. She challenges the familiar nutritional epithet "ignorant mother" as a doubly disempowering label: why mother rather than parent? Why are women nearly always labelled "mothers" in the nutrition arena⁴? As she point out, *"women emerge from the process of labelling classed as 'female parent responsible for child care and for nothing else'"*. The result is that programmes and benefits for child care are solely directed to women, while programmes and benefits for other aspects of life are directed away from them. "Ignorant" in the label establishes the moral power of the knowledgeable and educated, and suggests wilfull refusal to correct inappropriate behaviour. Mothers with poorly nourished children can then be blamed for the condition.

Much of the discourse of international nutrition literature in the 1970's and 80's was reminiscent of British (and doubtless other) commentators in the late 19th and early 20th centuries as reported by Petty (1987). For instance lay and professional witnesses to the 1904 Committee on Physical Deterioration were unanimous in claiming ignorance and degenerate habits rather than poverty or adverse conditions of life as responsible for inferior physique. Witness after witness referred to the working class population as

"[...] very improvident; they are extravagant; they could live very much more cheaply."

"The average working man's wife is lamentably ignorant of the value of the different foodstuffs and her unintelligent selection, and bad cooking, amount practically to underfeeding, even though the bulk to all appearances be sufficient."

"[...] ignorance and idleness and want of sense of duty of British mothers."

⁴In fact, in the last five years or so "women's" nutrition has begun to emerge as a new focus in international and national agencies - as in other disciplines and sectors. The focus is still a combination of welfarist and human capital approaches, and uses new sets of labels - "breadwinners" "farmers" - as well as old - "mothers".

"The last thing they think of is duty and, therefore, they do not take the trouble to cook or get up in the morning and the children go to school without breakfast."
(Petty, 1987, p36,37).

Much concern was expressed at what was regarded as excessive use of ready prepared foods, such as fish and chips or pies, and of bread and jam instead of porridge. Petty points out that no account was taken of how hard women had to work, nor their lack of adequate cooking facilities. The contrast with contemporary accounts sympathetic to the realities of poor women's lives, such as Maud Pember Reeves (1913) is striking:

"The diet where there are several children is obviously chosen for its cheapness, and is of the filling, stodgy kind. There is not enough of anything but bread. There is no variety. Nothing is considered but money."
(Pember Reeves, 1979, p103).

Petty argues that the effect of this focus on personal habits directed public health attention away from social reform as in the 19th century (on sanitation and housing for instance) to the behaviour of individuals - especially mothers - within the domestic environment: a preoccupation which has come in and out of focus ever since.

The alternative approach to nutrition as an "investment right" is part of the human capital and development argument: that people should be able to perform adequately in society. Nutrition is a component of individual and society's development; those with inadequate nutrition do not grow properly as children, and thus cannot benefit from education; and as adults cannot work^{productively} or function e.g. as parents. Nutritional needs should be addressed to maintain development's momentum; the investment may be in the public or private spheres. The long preoccupation in the UK with the cost of diseases and conditions which are seen as nutrition related (such as obesity, or coronary heart disease) is arguably part of the same tradition: nutritional needs should be addressed because they are costing society money in terms of increased demand for health care, lost work output and greater mortality among the working age

population⁵. The problem with the investment approach is that, firstly, the linkage between human size and reduced work productivity is under challenge (see, for example, Tuffrey's recent thesis (1994) on child growth, adult body size, work capacity and grain output in Nepal). Secondly, for those who have poor prospects of work in societies where unemployment is high, personal fitness has no means of contributing to society's wealth generation; nutritional support can no longer be justified. Thirdly, prolonged life expectancy is presumably only to be welcomed in those contributing to society's economic gain - which the elderly on benefits, for instance, do not. These consequences of justifying nutritional contributions to human capital investment are seldom explicitly addressed.

Both welfarist and human capital development approaches can reflect a concern with equity, though, as mentioned, people's rights (whether as citizens, marginalized or as refugees) are seldom used as a basis for nutrition policy. Lip service is often paid to "quality of life" arguments; policy in relation to food and nutrition is seldom based on them. In the international nutrition scene there has been some interest in using nutritional measurements of sections of society as outcome or impact indicators of the development process (Pacey and Payne, 1983; Dowler, 1987/8; ICN, 1992), which implicitly acknowledges development, or economic adjustment, to have had differential consequences on nutritional conditions. There is current interest in the UK in developing outcome and impact nutrition indicators to evaluate projects to alleviate the worsening nutritional circumstances of low income groups, who have arguably borne the cost of economic growth strategies of the last two decades. There is not, as yet, interest in using nutritional indicators simply as part of poverty assessment. One purpose of this thesis is to argue for their inclusion in the process of defining and quantifying poverty.

⁵"'an epidemic of obesity' is costing the NHS £2 billion a year, as well as undermining the Tories' 1992 health 'targets', which had aimed at 'a leaner nation'. Can we now have a sub-total for the total drain on public funds, accounted for by obese welfare cheats? £1 billion? More? It hardly matters: all such figures are made up anyway." (following a piece about the new strategies to cut-down on social security fraud) Dan Atkinson, city pages, The Guardian, 13th July 1995.

Nutrition is sometimes seen by individuals and by government as one aspect of individual lifestyle, or personal choice. The polarization is thus set between those who see poor nutrition as a problem of personal inadequacy at some level: an inability to manage or cope on whatever resources are available, and those who see it as an outcome of a set of structural problems, whereby individuals or households lack access to or control over resources or opportunities to secure a reasonable livelihood and thereby a healthy diet. The intervention role of the state, at national or local level, is crucially distinct. In the first case, it is essentially one of information provision to enable appropriate choice, and market liberalization to allow such choice efficient expression. People making inappropriate choices need help - more information, better skills. In the second case, the state role is one of regulating access to and control over food (including the role of multinationals in food procurement and distribution) and other resources such as jobs, and of responsibility to those whose position becomes unsustainable. In practice, the distinction between policy responses may not be marked: the premise of much nutrition education is that personal abilities in, say, "child care", family feeding, or in budget management, are skills rather than attributes of personality; they can be taught and learnt. Others in nutrition education will be more concerned that, given the structural and possibly intractable nature of poverty (whether pre-or post-capitalist) little can be done by and for individuals other than to ensure they make best use of the limited resources they have.

Nutrition policy in the UK:

In the UK, there is no unique sectoral responsibility for policy in nutrition. On the health side the debate has been between correction of dietary deficiencies as a major component of public health goals (with food quality rather than quantity as the problem) or food as one of many environmental factors contributing to poor child growth and chronic ill health. It has also been a debate between those interested in redeeming or maintaining the physical stock of the nation, and those concerned to meet basic needs of the labouring poor, and to provide guidelines to enable the unemployed to eat frugally but sufficiently (Petty, 1987). Nutritional science has regularly been used to justify minimal income standards. In agricultural policy, nutritional issues

Nutrition: the policy arena

were largely ignored in the interests of the dominant group, namely farmers and producers generally: the provision of sufficient cheap food was said to satisfy all interest groups (Robbins and Bowman, 1983; Smith, 1991). Smith (1991), in arguing that the food and nutrition policy arena has become more contentious and overtly political over the last two decades, cites a number of possible reasons: the move into the common agricultural policy, rising competitive economic power of food retailers, new technology for food production and storage, and increase in scientific information made public by media and advisory committees. He also sees the policy arena as more open to public scrutiny and consumer response: the previously closed policy community (dominated by agriculture with compliant health and industry sectors) has not been able to contain issues such as food safety, biotechnology and environmental concerns. The links between diet and chronic disease have also become public controversies (e.g. Walker and Cannon, 1984 (especially the introduction, ppix-xviii) and the food industry's (over)reaction to publication of the COMA report on Nutritional Aspects of Cardiovascular Disease (DH, 1994a).

The official approach from the UK government has long been that individuals are responsible for their own diets as a component of their health; thus state responsibility is to enable individuals to make informed food choice (DHSS, 1977; Wiseman, 1990). The output of government nutrition policy has essentially been provision of information: labelling of nutrient content and broad usage on foods, and education or information to the customer to enable appropriate purchase. Wiseman (1990), head of the DH Nutrition Unit, describes implementation of this individual's informed choice strategy by three government departments. The Department of Health (DH) provides scientific information and advice (hence regular reports from the Committee on Medical Aspects of Food Policy, or COMA) which is turned into public messages by the Health Education Authority (HEA). The Ministry of Agriculture, Fisheries and Food (MAFF) ensures a wholesome and sufficient supply of food, monitored by the Public Analysts Scientific Service. MAFF is also responsible for measuring national food intake. The Department for Education and Employment (DfEE) (formerly Department of Education and Science) funds the Medical Research Council which in

turn funds basic scientific research, and DfEE is of course responsible for public formal education. This scene of non-controversial co-operation does not quite match the reality, some of which is mentioned above. In addition, the food industry has an implicit role in providing foods consumers want to buy, with appropriate labels. Some commentators argue that in practice the food industry exerts a powerful if hidden role in negotiation and collaboration, with MAFF in particular, and in sponsoring nutrition research for members of COMA committees (e.g. Cannon, 1987; regular articles in The Food Magazine, produced by the Food Commission). Others point to the food retailers, who nowadays constitute a large part of the food industry, as a strong economic force influencing food policy and, on some reckoning, siding with the consumer against producers and MAFF (Smith, 1991). No group has responsibility for executive coordination of government and private sector activities.

According to Smith (1991) consumer interests lost a focus in government machinery when the Ministry of Food, created during the Second World War, was amalgamated with the Ministry of Agriculture and Fisheries in 1955. Since then, consumers have had some representation on food related committees (e.g. COMA, Food Advisory Committee); more recently MAFF created a Consumer Panel in the early 1990s "*to meet ministers or their representatives*" (R.Taplin, MAFF, personal communication). Consumer interests are otherwise maintained by the National Consumer Council (e.g. NCC, 1992), which receives some government funding; the independent Consumers' Association (whose publications Which? and Which? Way to Health? both regularly carry items about food and nutrition); the independent Food Commission; and the National Food Alliance (NFA), a public sector umbrella group active in raising issues and lobbying over food. To some extent the British Medical Association has also raised food and health issues from the consumer perspective. Few groups appear to have active channels for consumer contact, although several represent consumers in UK, European and wider international committee, discussion and policy fora.

Nutrition and low income/poverty

"Since nutrition related policies and programs are needed to correct for undesired effects of skewed asset distribution and insufficient endowment among certain population groups, they usually involve direct government transfers or market distortions. Opportunities for capturing the resulting benefits [...] are present, and the competition from groups that are not at risk of malnutrition is strong. Nutrition does not have a natural home in government, in contrast, say, to agriculture or health. Therefore in the traditional structure and organization of government, it is unlikely that any government agency places first priority on nutrition improvements."

(Per Pinstrup-Andersen (ed.) (1993) The Political Economy of Food and Nutrition Policies. Baltimore: Johns Hopkins University Press, for the International Food Policy Research Institute, p225.)

To those who regard nutritional problems as an outcome of entitlement failure it is significant that no UK institution exists with responsibility for monitoring nutritional conditions of low income households; for relating food prices to consumer income or effective demand; for reviewing strategies for siting and management of retail outlets in relation to needs of low income groups. Income Support, the basic subsistence benefit for those with no other means of support, is simply deemed sufficient to purchase a healthy diet. Policies which are based on the supremacy of the marketplace, as over the last 16 years, do not address who can get to which "market place", nor how much they need to spend.

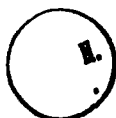
Nutrition problems in low income households appear to be regarded by and large as "personal inadequacy": nutritional ignorance, or poor budgeting and shopping practices; intervention is the domain of health education and home economics. As for so much of the century the state seems to work on the hypothesis that poorer people eat badly because they are obstinate, unskilled managers, or stupid (Pember Reeves, 1913/79; Mack and Lansley, 1985; Wheeler, 1985, Petty, 1987; Hobbiss 1993). In this view they are supported by the media: tabloids regularly exploit stories of the feckless poor; radio and television interviewees readily assert that (e.g.) *"anyone who says they can't eat properly on a low income or 'the social' is either lying or just lazy"* (woman interviewed on BBC Radio 4 Today, Tuesday 20th June 1995). The evidence is to the contrary. Nutrient intake data, food usage patterns and budgeting practices from

quantitative and qualitative studies were summarized in chapter 1. The poorest usually budget well, are skilled managers, and spend the least per head on food. But food is the flexible item in tight household budgets, and "healthy" eating is usually more expensive, especially if variety, and fruit, are sought. Nutrient intakes are lower in poorer households than in less poor, and diets are much less varied. Mothers especially live on "tea and toast" to enable their families to eat better (Lee, 1990; Graham, 1993). Poorer people seem to know what they are doing: trading the immediate need for family integrity and security against future health.

Those who work with low income households or with the food aspects of poverty, have tried for some time to raise the issue in the public agenda as an entitlement failure and part of a structural problem (e.g. the food section of the 1970's ad hoc "Politics of Health Group"; Walker and Church, 1978; Lang *et al.*, 1984; Doyle *et al.*, 1982; Mack and Lansley, 1985; Cole-Hamilton and Lang, 1986; British Dietetics Association (Hanes and MacDonald, 1988); Graham, 1986; regular items in the Food Magazine; the National Children's Home (NCH, 1991); Cohen *et al.*, 1992). In the last few years, they seem to have had some success; poverty and food has been become more visible. For instance, a recent NCC seminar followed up NCC earlier work (NCC, 1992) on the impossibility of obtaining a healthy diet on benefits⁶. The NFA produced a food and low income resource pack (Leather and Lobstein, 1994) with DH funding, and had HEA support for four regional conferences to promote it. These conferences were well attended and over 1000 packs have been sold: evidence of the extent of interest. State research support includes the MRC (Macintyre *et al.*, 1989) and new ESRC programme, with possibly a DH programme in the near future (Wilkinson, 1995b).

The DH reported that many responses to the 1991 Green Paper and 1992 White Paper strategy document for improving the nation's health, Health of the Nation (DH, 1992),

⁶NCC Seminar on Benefit Levels and Access to a Healthy Diet: Wednesday 26th April, 1995. Four presentations were made and copies of correspondence with DSS (who sent no representative despite an invitation) were distributed and discussed. The discussion paper was published in late 1995 (NCC, 1995).



had emphasized the role of low income and poverty in causing or mediating negative health outcomes and mortality. Partly as a result, the national *Nutrition Task Force* (NTF), created in response to the White Paper, commissioned a working paper: *Diet and Poverty in the UK: A Review of Contemporary Research Methods and Current Experience* (Dowler & Rushton 1994)⁷ ⁸. The *Nutrition Task Force* has representation from a number of state sectors (Health, Agriculture, Social Security, Scottish and Welsh Offices) and public and private institutions concerned with food and diet. The ^{working} paper was presented and discussed at the October 1993 meeting. In its subsequent first report, the NTF recognized that "*people on limited incomes may experience particular difficulties in obtaining a healthy and varied diet*" (DH, 1994b, p32), and set up a Low Income Project Team (LIPT) in June 1994 to begin to address them. Significantly, review of the level of means-tested benefits was explicitly excluded from the terms of reference; the separation of measures to alleviate "deprivation" from those addressing income is implicit. Furthermore, the NTF "*concluded that the needs of this group [low income households] could not be met by national actions. The NTF [...] considers that the most effective way to assist people on low incomes in the first instance is by encouraging effective local initiatives and projects*" (DH, 1994b, p32). It was perhaps a compromise to deny the role of national action in order to be able to do anything about low income and food at all. However, the small Project Team was initially established to "*collate and disseminate examples of good local practice*" (DH, 1994b, p32). (How and why the Project Team widened its brief is discussed in chapter 7.)

On the broader issue of social differentials in health and mortality, many academic and independent researchers have called for action of various kinds: e.g. the European

⁷The review highlighted key areas for intervention and research, and identified the main problems in investigating the relationship between nutrition and poverty: how "poor diet" or "nutritional deprivation" are defined and measured; how "poverty" is defined; and how low income/poor groups can be contacted

⁸In addition, general concern and controversy surrounding publication of the so-called "MAFF £10 diet" (MAFF Food Science Division 1, 1992; Lather, 1992) triggered interest in, and anxiety about, low income and diet in MAFF (R. Taplin, MAFF, personal communication).

Nutrition: the policy arena

Public Health Alliance and British Medical Association (1994); Power (1994); and editorials in public health journals (Svensson, 1993; Townsend, 1994; Whitehead and Dahlgren, 1994; Wilkinson, 1994b, 1995b). Whitehead (1995) asserts that the European office of WHO has maintained pressure on all European governments both to acknowledge social inequalities in health and to take action. Apart from demands for a Royal Commission on poverty and health and a call for policies to address income differentials (Davey Smith and Morris (editorial), 1994), the most detailed and wide-ranging call for policy initiatives has come from the King's Fund (Benzeval *et al.*, 1995). Examples of initiatives under four areas are given: the physical environment (housing), economic influences (family poverty: call to increase benefit levels); healthier lifestyles (smoking); health services (NHS); with brief mention of issues around education, unemployment and childcare.

The UK government response has so far been muted, although a working group to examine social position and health and the role of the Department of Health and the National Health Service was set up as part of continuing review of the Health of the Nation targets; it reported in November 1995 (DH, 1995). The difference in the Dutch Government approach (Mackenbach, 1994) is striking: they initiated a national research programme in 1989 with crossparty consensus based approach. (Nonetheless there has in practice been a focus on "lifestyle" factors for research and intervention, these being seen as politically neutral (Mackenbach, 1994, p1490). In the UK the Department of Social Security insists the mechanisms of relationships between low income and health outcomes are unproven at least where nutrition and food are concerned, and that there is no role for social policy (B. Revelly, DSS Policy Division, personal communication). The public ministerial stance of the Department of Health, the prime mover for any policy initiatives so far, has continued to be that

"variations in ill health among different ethnic, social and occupational groups, and in different geographical regions [...] is [sic] likely to be the result of a complex interplay of genetics, biological, social environmental, cultural and behavioural factors. We need better understanding of how these factors interrelate and at what points it is possible to undertake effective interventions."

(Rt Hon Virginia Bottomley, JP MP, message to the European Conference on Action on Social Inequalities & Health. European Public Health Alliance & British Medical Association, 1994).

These words are clearly taken from the Health of the Nation (DH, 1992); the document did not seriously address socio-economic factors in relation to health differentials, or policy instruments to reach the stated health targets. Despite this apparent call for more research, until the last few years little had been undertaken since publication of the Black Report⁹ (Townsend and Davidson, 1982), as Davey Smith and colleagues point out:

"The parsimony of a materialist explanation makes it attractive, but research in this area has not advanced greatly since the appearance of the Black Report. A major reason for the relative paucity of evidence concerning the link between material conditions and health is the lack of enthusiasm for investigating this area"
(Davey Smith *et al.*, 1994, p140).

Summary:

This chapter has reviewed the institutional and intellectual problems for policy in nutrition, in general and in the UK. UK state sectors with policy responsibilities for nutrition have tended to sideline or ignore the role of low income or poverty until recently; the reasons were discussed briefly and current positions outlined. These issues are pursued in the final chapter of the thesis, in the discussion of the implications for policy of the field survey. The next four chapters describe the case study, how the empirical data were collected and what they revealed.

⁹The Black Report (after its chairman, Sir Douglas Black) was produced by a Working Group on Inequalities in Health, commissioned by the then DHSS in 1977. Publication was restricted to a few duplicated copies of the typescript over the August Bank Holiday in 1980. However, the resulting publicity led to extensive press coverage, public and professional attention, and a House of Commons debate in 1981. Peter Townsend (a member of the Working Group) and Nick Davidson published a slightly edited text, with some statistical updating, in a Penguin paperback in 1982.

Chapter 3 THE CASE OF LONE PARENTS IN THE UK

"Because of the increase in homelessness, disability and unemployment, and the likely trends in one-parent families and employment mobility, the problem of representing the poorest groups in the population is likely to grow."

(Judy Jones, "DSS survey of income 'misleading on poverty'" The Independent, 12th March, 1992)

This chapter describes why and how lone parents were chosen as a case study of nutrition and poverty in the UK, and details characteristics of the sample drawn.

There were two reasons for the case study choice. First, because lone parents constitute a large proportion of households in the UK who are poor, however that poverty be defined and measured. Secondly, despite media attention, some of which is chronicled in this chapter, little was known about nutrition and diet in lone-parent households. Each of these issues is expanded below.

Lone parents are defined by the state as families with a mother or father living without a spouse and not cohabiting, with her or his never-married dependent child/ren, aged under 16, or 16-19 and in full-time education (DHSS, 1974). This definition, while straightforward on paper, is hard to use in practice, not least because people do not always simply live with or without a spouse or partner, and information about cohabitation is absent in the main sources of demographic data (Haskey, 1991). Notwithstanding, there were about 1.4 million lone parent families in Great Britain in 1994, containing approximately 2.2 million dependent children (Social Trends, 1995). The proportion of lone-parent families has risen from about 10% of families with dependent children in 1976 to the present 19%, or about one in five. Comparable increases have been seen in most industrialized countries (Roll, 1992b). The reasons given include: an increase in the rate of divorce and separation; a decline in remarriage rates for divorced women; and a large increase in births outside marriage and latterly outside cohabitation (Haskey, 1991). But this picture of simple growth is misleading. Relationships are not static: people partner and repartner, though the patterns of doing so are complex (Ermisch, 1990; Bradshaw and Millar, 1991; Burghes, 1994), and people may become lone parents more than once. Lone parenthood is therefore not a

pathological or unusual state, but one common to many parents and children in Britain at some stage (Burghes, 1993).

The majority of lone parents are divorced or separated mothers: these two categories account for 52% of all lone parents, only 8% of whom are lone fathers. Since 1991 the proportion of "single, never-married" lone mothers has been the fastest growing group, and at 33.8% formed the largest single group (Burghes, 1994). Although this category includes mothers from previously cohabiting relationships, the increase in lone-parent families where no formal relationship has existed between the mother and father(s) of dependent children has generated considerable concern among politicians and some of the media:

"The Social Security Secretary, John Moore [...] rhetorically asked the Conservative Party Conference: 'Is the hope of a council flat and a guaranteed income a factor in unmarried teenage pregnancy? Is the knowledge that the state will provide, a factor in fathers deserting their families?'"

(Alan Travis, "Time for Cathy to come home again?" The Guardian, November 23rd, 1988)

"Lady Thatcher lambasted the Government yesterday for not going far enough to encourage stable nuclear families or to punish 'never-married single parents' by making their benefits conditional upon living with their parents or in supervised accommodation. 'Together with quicker and better procedures for adoption, this would safeguard the interests of the child, [and] discourage reckless single parenthood,' she said in the second extract from her new volume of memoirs The Path To Power".

(Michael White, "Thatcher says Government is too soft on 'reckless' single parents" The Guardian, 1995).

Lone parents are not really a homogenous group: they vary by age, class and to a lesser extent gender (see table 3.2 below), in routes into and out of lone-parenthood, and in their personal experiences. What they mostly have in common is their marginalization, largely because of economic circumstances, and ambiguities of treatment by society and the state (Hardey and Crow, 1991). While it may be difficult to identify and characterize "lone parents" as a discrete category, the state, the media and society do so, and the present survey continues that tradition (in practice, two

The case of lone parents in the UK

parents contacted had recently married, and about half a dozen had partners of some degree of permanence around, though not living in the family home).

Lone parents and poverty

"'Lone parents and the benefits they get must surely be high on the agenda for discussion in the public expenditure round,' said a senior DSS source. 'It has got to be an issue.' Spending on lone parents has increased more than five-fold since the Conservatives came to power, rising from £1.7bn in 1978/79 to £9.4bn in 1995/96 [...and is now] more than 10 per cent of the current £85bn social security bill." (Paul Routledge "Lilley targets single parents" Independent on Sunday, 13th August 1995).

Politicians, officials, journalists and academics often refer to "lone parents" when discussing households likely to be poor, or claimants of means-tested state benefits. Indeed the DSS identifies "lone parents" as one of five distinct claimant categories in its regular publication of Income Support statistics (the others are: age 60+, disabled, unemployed and "other"). Lone parenthood in the UK is perceived as a significant and growing drain on public resources, because numbers of lone parents are increasing, and because an increasing proportion rely on state benefits for income (in 1971, about 37% of lone parents: in 1994, about 72% (Bradshaw and Millar, 1991; DSS, 1995).

There is no doubt that the majority of lone parents are poor: 1,039,000 were claiming Income Support in 1994 (DSS, 1995); they constituted 15% of the bottom quintile of the income distribution, but only 4% of the population in 1990/91 (DSS, 1994). The income of one in two lone parents is below 50% of average income, and about 14% have incomes below 40% average income (DSS, 1994). (If housing costs are taken into account, the proportions rise to three in five below 50% and 28% below 40% average income - the highest proportions of any family type.) Sixty percent of lone parents had gross weekly incomes of £150 or less in 1992; only 11% of married couples had gross incomes that low, and 59% of married couples had weekly incomes above £350 (quoted in Middleton, 1995). In 1989, more than three quarters of children in lone-parent families were living on incomes at or below 140% Income Support level, as opposed to 13% children of two-parent families (Oppenheim, 1993). The recent Inquiry into Income and Wealth in the UK (Joseph Rowntree Foundation,

The case of lone parents in the UK

1995) demonstrated that income inequality increased rapidly in the 1980's because of the gap between earnings and benefit dependence (see chapter 1), and that lone parents and the unemployed figured more among the lowest centiles than in the past. The same Inquiry produced evidence of the geographical concentration of poverty in particular wards and areas; similar evidence comes from Philo and colleagues (Philo, 1995). Inhabitants of so-called "sink estates" in inner and outer cities are more likely to be never-married lone parents, particularly those who are relatively unskilled with few qualifications (Crow and Hardey, 1991). Middleton (1995) uses 1991 census data to show that lone-parent households were more likely than married or cohabiting couples with dependent children to be lacking basic amenities (own bath/shower/WC) and much less likely to have central heating (23%) or access to a car (67%).

Families with dependent children are likely to have lower incomes than those without dependents (Social Trends, 1995); lone parents are even more likely to have lower incomes. They are likely to be dependent on the state for income in the UK because they are less likely to be in full-time work than partnered people with children or single people without children, and where they are in paid employment, are more likely to be in low paid jobs, particularly if they are female (Bradshaw and Millar, 1991). The socio-economic characteristics of lone parents in the UK are summarized in figure 3.1. As this figures shows, lone parents are unlikely to receive substantial contributions to living costs from former partners. For those claiming Income Support, maintenance costs which are received are deducted £ for £ from benefit, and the lone parent is unlikely to be better off financially. The Child Support Agency, set up in 1992 (DSS, 1990) to retrieve realistic maintenance from absent parents, has to date concentrated on benefit recipients' maintenance needs in order to meet its own financial efficiency targets; the amount of maintenance money going to the DSS has increased, that to the parent-with-care has hardly changed (Garnham and Knights, 1994).

figure 3.1 socio-demographic characteristics of lone parents in the UK

- fewer than 1 in 10 lone parents is male
- 31% lone mothers single; 18% separated; 33% divorced; 6% widowed
- about three-quarters of lone mothers with children under 5 years, and nearly half those with children over 5 years, are unemployed
- about half of lone mothers in employment, work part time
- single mothers are most likely to have younger children, and are least likely to be in work; lone fathers tend to have older children, and are more likely to be in work than lone mothers
- 80% of single mothers, 55% divorced/separated mothers and 4% lone fathers, live in local authority housing; the rest live in owner occupied or privately rented housing
- regular maintenance payments from non-residential absent parents received by 1 in 7 single mothers (£15 per week); 1 in 3 divorced/separated mothers (about £30); 3 in 100 lone fathers (£9.50)
- 90% of single mothers; 50% divorced/separated mothers; 14% lone fathers receive Income Support
- single mothers usually worse off than divorced/separated mothers
- lone fathers are usually better off than lone mothers
- large one parent families (3+ children) tend to be worse off than small ones (allowing for differences in family size and ages)

taken from: Burghes, (1993) and Social Trends, (1993)

Lone parents obviously face many difficulties in bringing up their children and leading fulfilled lives of their own. Until late 1995 lone parents' extra financial needs were acknowledged by the state (Lewis, 1989): they qualified for premiums and special treatment in statutory benefits, such as child benefit, Family Credit and Income Support. However, the 1995 budget signalled that this recognition of higher domestic costs for lone than coupled parents seems to have ended: one-parent benefit (a supplement to child benefit) and lone-parent premium in Income Support are to be frozen at 1995 levels, and will be available only to existing claimants:

The case of lone parents in the UK

"The costs and responsibilities of having children are the same for couples as they are for single people', the Chancellor, Kenneth Clarke, declared in his Budget speech as a precursor to cuts in benefit for lone parents."

(Sarah Boseley, "Figures belie Clarke stance on lone parents" The Guardian, 30th November, 1995).

The costs to taxpayers of lone parents (who are presumably assumed not to be taxpayers) is regularly given as justification for the change:

"Peter Lilley, the Social Security Secretary, said he would review the benefits annually. 'my intention over time is to continue to narrow the gap between lone-parent benefits and those which go to couples.' He put the 'cost to the taxpayer' of lone parents at more than £9.4 billion."

(David Brindle, Chris Mihill and James Meikle, "Squeeze on lone parents' benefit" [lead front-page story] The Guardian 29th November, 1995).

Lone parents who want paid work have arguably been less discouraged by benefit rules than other claimants (Bradshaw and Millar, 1991; Rowland and Webster, 1991). However, apart from a small change in child care tax allowances for working lone parents in the 1994 budget, and a pilot scheme for training to start in 1997 in the 1995 budget, there have been few serious attempts to help lone parents into employment and/or out of poverty.

Nutrition and diet in lone-parent families

As well as being characterised as poor, lone parents in the UK tend to attract public criticism. As the quotations above illustrate they are often portrayed by politicians and the media as "welfare scroungers", or as representing the "undeserving poor"; their children are said to be more likely to do badly at school and to be involved in crime; both parents and children are said to cost the taxpayer an unjustified amount of money. Lone parents' abilities to manage household wellbeing are regularly under challenge, despite research on the financial circumstances and budgeting practices of lone parents in particular (Bradshaw and Millar, 1991), and as a type of low income families (Graham, 1993; Dobson *et al.*, 1994; Kempson *et al.*, 1994). This evidence shows that lone parents, along with other poorer households, spend much time and energy trying to manage and control limited income and expenditure and generally succeed, albeit at personal cost to health and wellbeing. Research on the health status of lone parents

and their children (e.g. Popay and Jones, 1991) has shown that whatever the indicators used, lone parents' own health tends to be worse than in two parent households, particularly among the poorest lone parents. The children of lone mothers have the highest death rates of all social groups, principally because of injuries (Judge and Benzeval, 1993), which Roberts and Pless (1995) argue is a function of a combination of poor housing, poverty and social isolation.

It seemed reasonable therefore to ask: how do lone parents feed themselves and their families? At the time of the survey, not much was known about food and diet in lone parent households. Two small studies of children's nutrient intakes (Darke *et al.*, 1980; Moynihan *et al.*, 1993), produced rather inconclusive results, and lone parent households were either under-represented in, or seldom mentioned in publication of, UK national nutritional statistics¹ (such as the National Food Survey; or the Adult Nutrition Survey (Gregory *et al.*, 1990), which had 76 lone parents in its sample of 2,000; or the Scottish Heart Health Study (e.g., Bolton-Smith *et al.*, 1991). The present survey, of nutrition and diet in lone-parent households, and the food coping strategies adopted by those who are poor, was therefore designed to address two questions:

- what are the nutritional conditions in lone parent households?
- for those who are poor, what are the nutritional consequences of the coping strategies they adopt to contain their poverty?

The remainder of this chapter describes how the lone-parent households were identified and contacted, and the demographic and social characteristics of the achieved sample. Details of the measurements made in the survey, the methods used, and indicators derived, are given in chapter 4. In summary, the field survey was as follows: a random sample of lone-parent households was contacted, and each visited at least twice. During the first visit, a dietary intake survey was set up and a preliminary

¹The recent PreSchool Nutrition Survey (Gregory *et al.*, 1995) published toddlers' nutrient intakes by family status, including lone-parent families.

questionnaire completed. During the second or subsequent visit(s), the dietary survey records were checked, all household members present were weighed and measured, and a food frequency questionnaire and longer, taped interview completed. The first contact interview took about an hour; the second interview about one and a half to two hours. During the first visit respondents were offered a £10 voucher for one of the big supermarkets on completion, to acknowledge their help and as a token of thanks.

Drawing and contacting the lone-parent household sample

The survey was confined to London because of time and cost constraints. The implications for sampling bias are discussed below. Sampling was done by the DSS through two routes: one-parent benefit and Income Support. Lone parents are entitled to claim one-parent benefit (OPB) as a supplement to universal child benefit (paid to all parents or guardians of dependent children). However, since the OPB amount is deducted from Income Support, those who claim the latter sometimes choose not to claim OPB. Therefore a sample of lone parents cannot be exclusively identified through OPB claimants in centralized child benefit records; it must also be done through Income Support records, which is a more complicated procedure. The sampling techniques the DSS used for this survey were similar to those of the 1989 national lone-parent household survey (Bradshaw and Millar, 1991). For the samples from child benefit/OPB records the DSS matched postcode areas provided by the author to Post Office sectors, and random sampling fractions proportionate to PO child benefit encashment levels for each were derived. These samples, which were relatively straightforward to obtain, produced names and addresses for the first four rounds of field work in NW/NE/SW/SE London respectively. They formed about 60% of the total sample. Secondly, the DSS matched postcode areas provided by the author to Income Support District Offices, and negotiated random samples from each individual office. These samples were more troublesome for the DSS to obtain, and were therefore confined to SE London only; in addition, it was anticipated they would be less likely to contain accurate names and addresses. They provided 40% of the total sample, and were completed in three further rounds of field work. There was no

intrinsic basis for choosing one part of London rather than another; the DSS had simply stated that the whole of London could not be used for the Income Support sampling, so south-east London was chosen because both field workers lived there, and driving time was reduced. Lone fathers were included by the sampling procedure; widows were likely to be excluded (they do not claim OPB).

Many lone parents contacted through the child benefit records were also Income Support claimants; the purpose of splitting the source was to sample those who are in receipt of Income Support but might not claim one-parent benefit (in practice, many did). For each round of field work the DSS sent an introductory letter to sample names and addresses, giving respondents two weeks to opt out; the field workers wrote to those who remained with an appointment time when the field worker would visit, within four weeks. A contact telephone number was included, where messages could be left to change appointments. Where no response was obtained at the first visit, repeat visits were made (at least four), with notes suggesting alternative appointments and giving the contact telephone number. Every effort was made to contact everyone in the sample. Although what sometimes proved fruitless visiting took a lot of time, the effort was worthwhile where contact was finally made.

The sample target was 160 households (minimum 120)² preferably evenly divided between those who did and did not receive social security benefits, although there was no way of guaranteeing that split with the sampling method employed. A non-response rate of 55% was expected (non-contacts, and dietary survey drop-outs and rejects), from Bradshaw and Millar's experience (1991) and a pilot survey in March 1992; this gave a total sample of about 350 households. Successive geographic samples of 50 households for seven rounds of field work were drawn. Interviewing was done by two fieldworkers (the author and Claire Calvert) from May 1992 until the end of June 1993.

²Standard sampling design procedures were adopted (Kirkwood, 1988, and statistical advice from colleagues in the Department of Epidemiology and Population Science, LSHTM).

The case of lone parents in the UK

The DSS forwarded 320 names and addresses (30 had opted out); a further 46 refused to take part when first contacted by the fieldworkers (most said they were not interested, a few had too many problems, or had had recent family deaths); 11 people wanted no further contact after the first meeting. Thirty-three of those contacted were ineligible for the survey: the person was not a lone parent or the addresses were incorrect. Despite considerable effort, no contact could be made with 41 households.

table 3.1 lone-parent households sampling response rates

<i>survey round</i>	<i>% withdrew at DSS stage</i>	<i>% moved/ ineligible</i>	<i>% no contact</i>	<i>% refused</i>	<i>% took part</i>
1 - 4 (child benefit sample); n=200	7.5	9	10	11	62.5
5 - 7 (IS sample); n=150	10	10	14	16	50
1 - 7 (total sample); n=350	8.6	9	11.7	13.1	57.1
% addresses received; n=320	-	10.3	12.8	14.4	62.5
% eligible of addresses received; n=287	-	-	14.3	16.0	69.7
% eligible total sample; n=317	9.5	-	12.9	14.5	63.1
% eligible who completed interview					59.6
% eligible with dietary record (households)					41.3

Response rates are shown in table 3.1. They were reasonable for the rounds drawn from child benefit records. Response rates were poorer in rounds drawn from local Income Support Registers in SE London, partly because of more refusals, partly because addresses were out of date or incorrect, and partly because of a higher non-contact rate, some of which was probably also due to incorrect addresses. Efforts to correct addresses via the DSS or Southwark Council yielded one extra respondent. The total response rate was better than expected for the interview and food frequency data (60%) but slightly lower than anticipated for the dietary records (41%). However, expectations had not been very firm for the dietary survey: there had been no

The case of lone parents in the UK

information in the literature about response rates in lone-parent households, and Bradshaw and Millar (1991) had had rates below 47% for their interview and financial expenditure surveys from inner city lone-parent households. The Joseph Rowntree Foundation Advisory Group members and nutritional colleagues were in agreement that the rates achieved had been reasonable and acceptable.

In summary, minimal data were obtained on 200 households, detailed interviews and food frequency data from 189, and individual 3-day food intake records, weight and height, for the parent and at least one child, from 172 households, of which food intake data from 131 was usable (131 parents and 196 children: 327 dietary records in total). The sampling target was achieved and no obvious biases introduced by the sampling procedure.

Characteristics of the sample contacted

There were no difference in demographic factors between the child benefit and Income Support samples and the two were combined for analysis. Demographic and socio-economic characteristics of the sample contacted are shown in table 3.2, with data from two recent national surveys (Bradshaw and Millar, 1991; McKay and Marsh, 1994). Those in the London sample tended to be older, with a correspondingly higher proportion of older children, than those in the DSS 1991 national survey (Bradshaw and Millar, 1991). There was also a higher proportion of black British and black Afro-Caribbean households in the London sample, reflecting the greater incidence of ethnic minority households in that population. Otherwise, the London sample was very similar to the two national surveys.

table 3.2 characteristics of lone parents in nutrition and national surveys

	<i>nutrition survey 1992/3 n=200</i>	<i>DSS 1989 (Bradshaw & Millar, 1991) n=1,428</i>	<i>DSS 1991 (McKay & Marsh, 1994) n=2,200</i>
<i>Marital status</i>	%	%	%
Divorced	36	44	36
Separated	19	20	17
Single	42	37	46
Other ³	4		
<i>Gender</i>			
Female	95	95	94
Male	5	5	6
<i>Nos dependent children</i>			
1	39	53	45
2	32	32	35
3	20	11	15
4 plus	8	4	5
<i>Age</i>			
Under 25	12	24	17
25 - 29	17	21	22
30 - 34	19	20	21
35 - 49	46	33	35
>50	6	3	4
<i>Average age</i>	yrs	yrs	yrs
Divorced	40	36	36
Separated	39	33	34
Single	30	26	29
All	36	32	33
<i>Age of youngest child</i>			
0 - 4 years	42	46	na
5 - 9 years	22	26	na
10-15 years	27	21	na
Over 16 years	8	6	na

³two were widowers; one a widow/single; two were siblings; two were grandmothers

The case of lone parents in the UK

	<i>nutrition survey 1992/3 n=200</i>	<i>DSS 1989 (Bradshaw & Millar, 1991) n=1,428</i>	<i>DSS 1991 (McKay & Marsh, 1994) n=2,200</i>
<i>Ethnic group (self-defined)</i>			
White European	60	89	na
Caribbean origin/black British	25	4	na
African origin	10	1	na
SE Asian origin	2	1	na
Other/refusal	4	5	na
<i>Tenure</i>			
Owned outright	4	4	3
Owner with mortgage	13	24	25
Local authority rented	61	57	53
Housing Association rented	7	6	5
Private rented	6	6	9
Living with family/other	10	3	5
<i>Employment</i>			
Full time > 30 hours/week	20	19	na
Part time up to 30 hours/week	12	21	na
Not employed	68	60	na
Irregular employment	2	na	na
<i>Social security benefits</i>			
Income Support	70	70	68
One Parent Benefit	86	69	61
Family Credit	5	7	10
<i>Education qualifications (highest)</i>			
none	44	na	na
GCE O-level/CSE	26	na	na
GCE A level	6	na	na
degree/technical/ professional/vocational	20	na	na

Respondents, the "parent-with-care", were not always the biological parent of the dependent child/ren, but were all treated as "parents" of "dependent children" and are referred to as such in the text. One original hypothesis had been that family size and

complexity would make a difference to living conditions, through contributions to, or drain on, communal resources. Of the households contacted 132 consisted of a lone parent and their dependent children. There were 36 households with independent as well as dependent children (i.e. children over 16 and not in full-time education, only some of whom were in paid employment). In addition, six households were lone parents with dependent children living in the lone parent's parents' home; a further nine had the lone parent's parent or sibling living in the lone parent's household. The remaining 17 were larger, more complex households. Contrary to expectations, none of these household composition factors showed any relationship with the nutrition outcome variables. (However, the logbooks most likely to be incomplete and therefore not included in the dietary analysis were from poorer, larger households with independent as well as dependent children, particularly black households. The effect of this achieved sample bias for nutrients is difficult to predict.)

Household income was calculated from responses to an income prompt card used in the long interview, and adjusted for household size and composition (i.e. equivalized, see appendix 3); further details of these methodologies are given in the next chapter. As would be expected, there were marked differences in weekly income for those receiving Income Support and those whose income came mainly from earnings (Mann-Whitney $p < 0.0001$); these data are shown in table 3.3. As would be expected, there was more variation in income for those not claiming Income Support. There were also differences in income according to the *material poverty index* described in chapter 4. There was no difference in income or in the equivalized amount spent on food by ethnicity. There were no differences in income between lone parents in the sample who were single (ie, had never married) and those who were separated or divorced. Younger lone parents (under 35 years old, of whom there were 83 in the sample) had a lower mean weekly income than those who were older than 35. Respondents' jobs were classified using the Women and Employment Survey Occupational Groups (Martin and Roberts, 1984) and recombined to social class categories equivalent to those of the Registrar-General. As might be expected, there were differences in income, unadjusted and equivalized, by the socio-economic indicators often used as

proxies for income: education level, ownership of home or car and occupational social class.

table 3.3 Household weekly income total and adjusted* for household size and composition

	<i>total income</i> (<i>st. dev.</i>)	<i>adjusted income</i> (<i>st. dev.</i>)
total sample (n=177)	£129 (90)	£114 (80)
claiming Income Support (n=123)	£87* (25)	£80* (23)
no Income Support (n=54)	£226* (110)	£193* (104)
"black" households (n=58)	£120 (68)	£96 (45)
"white" households (n=111)	£136 (103)	£125 (94)
poverty index* =0 (n=75)	£180* (115)	£160* (101)
poverty index=1,2 (n=91)	£88* (25)	£78* (19)

* difference between those receiving Income Support and those not; those in poverty index=0 and those in poverty index 1 or 2 (Mann-Whitney-U) $p < 0.0001$

+ see appendix 3

* see chapter 4

"black" households - respondents were black African/black British/black Caribbean

"white" households - respondents were white European

Of those interviewed 36% were regular smokers. Smokers were more likely to be unemployed than in a job, and to be receiving Income Support. However, only 42% of Income Support recipients smoked, a lower proportion than reported for non-working lone mothers (58%) in the recent national survey of smoking in low income households (Marsh and McKay 1994), which was only partially explained by ethnicity. There were no differences in smoking rates between those whose jobs were classified as manual and those classified as non-manual. Smokers were more likely to be white: only 15% of the black African, British or black Caribbean parents interviewed smoked,

The case of lone parents in the UK

whereas 48% of the white British or Europeans smoked. There were no differences between those who smoked and non-smokers in terms of: household income; amount spent on food; whether or not people owned their home; whether people had secondary, tertiary or vocational education; whether parents were single, separated or divorced; and parents' age for those under 45. Only 3 of the 34 parents aged 45 or over smoked. There was no evidence that smokers dropped out of the food record part of the survey more than non-smokers.

Thus the field survey successfully obtained data from a random cross section of lone-parent households, who, ethnicity apart, were typical of lone-parent households in Britain.

Summary:

This chapter has briefly described the social circumstances of lone-parent households in the UK and documented the poverty many experience. Further, the terms in which these circumstances are represented in the media, as by politicians, are considered. The methods used to contact 200 lone-parent households for the thesis empirical case study have been outlined, and the socio-demographic characteristics of the sample obtained discussed. The next chapter describes the indicators used in the survey and methods to collect quantitative and qualitative data.

Chapter 4 NUTRITION IN LONE-PARENT HOUSEHOLDS: CASE STUDY METHODS

The chapter opens with a discussion of the nutrition outcome indicators used to assess nutritional conditions in lone-parent households. Then the methods for collecting social, economic and demographic information are described, and the means by which food practices and beliefs, and budgeting for food were investigated, are outlined. In each instance, methodological issues and their resolution in the field survey, are addressed in turn. Finally, data entry and analysis procedures are briefly covered. Further technical details are given in appendix 2.

Nutrition indicators used

The aim of the survey was to obtain data for three nutritional outcome indicators as shown in figure 1.1 in chapter 1: adequacy of individual's nutrient intakes; indices of food variety; and healthy dietary patterns. Each is discussed below, with comment on methods adopted.

a) *nutrient intake adequacy:*

was measured by comparing nutrient intakes to the Dietary Reference Values (DRVs). The lower a group's mean nutrient intake is as a percent of the reference intake, the less likely all members of the group are to be eating enough of that nutrient to avoid ill-health. The probability of deficiency increases as the percent of reference value achieved decreases. Individuals whose intakes of vitamins or minerals are very low, below the lower reference value, are at high risk of inadequate nutrient intakes.

People generally think of "nutritional deprivation" as not having enough to eat, or not being able to eat enough of the right foods for health. In practice, it is hard to demonstrate such a condition with certainty, because it is difficult to measure a person's habitual nutrient and energy intake, and to interpret the results unequivocally. Problems and potential solutions are discussed by Bingham (1987) among many, and by Dowler and Rushton (1994) particularly in relation to low income households in the

UK. Essentially, to produce a reasonable estimate of a person's mean daily intake of different nutrients, the food and drink people actually consume over a specific period are weighed and recorded, converted to quantities of energy and nutrients using food composition tables, and divided by the number of days of measurement. One critical issue is the length of the specific period: how many days need to be measured so that individuals can be classified correctly into "high", "medium" and "low" consumers of a given nutrient. Intra- and inter-individual variation in energy and nutrient intakes can be large, and different from one nutrient to another: a function of nutrient variability between foods, and of variability in individual daily food usage (Basiotis *et al.*, 1987; Marr and Heady, 1986; Nelson *et al.*, 1989). Reviewers often recommend using more than one method of investigation (eg. weighed intake method plus food frequency), and describe statistical methods for choosing the best numbers of days; these recommendations notwithstanding, seven days' measurement is often seen as a "gold standard" for all nutrients.

Nutrient intake adequacy is assessed by comparing measured intakes to requirement or reference figures, as described in chapter 1. UK Dietary Reference Values (DRVs), the generic term for reference intakes, include the Estimated Average Requirement (EAR), Reference Nutrient Intake (RNI), Lower Reference Nutrient Intake (LRNI) and Safe Level (DH, 1991). UK reference intakes are predicated on achieving adequacy and avoiding deficiency rather than ideas of optimal health. Requirement distributions are assumed to be normal, such that a notional mean requirement, the EAR, is at the mid-point; the EAR is usually used as the reference value for energy. For the majority of nutrients an RNI is defined as two notional standard deviations above the EAR (DH, 1991, p3); intakes above this amount are almost certainly adequate for most people. For some nutrients a LRNI has been defined, at two notional standard deviations below the EAR: a lowest cut-off for health (DH, 1991, p3). Fats, sugars and starches, including non-starch polysaccharide (NSP), are treated in a different way because it is difficult to associate deficiency signs and symptoms with low intakes. For the 1991 report COMA made pragmatic judgement about changes from current intakes needed to effect improvements in health, and gave guidance on "desirable

average intakes" (DH, 1991, pp2,13). For some nutrients, too few data on human requirements exist; COMA was therefore unable to set DRVs for these nutrients, opting instead for a "safe intake": sufficient to avoid deficiency yet low enough to avoid risk of undesirable effects (DH, 1991, p8).

As has been stressed before, reference intakes can be used to show the likelihood that groups of people are eating enough of a nutrient to avoid deficiency; they cannot strictly be used to predict whether any particular individual is eating enough. For groups of people, if their average intake of a nutrient is equal to the reference nutrient intake, the risk that members of the group are not eating enough is very small (DH, 1991). Individuals whose intake of a nutrient falls below the lower reference intake are almost certainly not eating enough of the nutrient concerned.

b) *dietary variety:*

was measured by Variety Frequency Scores, derived from a food frequency questionnaire, for total food variety, variety within cereals, fish, fruit, vegetables and a meat product score. The lower an individual's or group's Variety Frequency Score the less likely they were to be achieving sufficient variety for health.

In theory, people can satisfy their nutrient requirements by any combinations of foods. In practice, people do not eat nutrients as such: they eat foods, usually in meals or snacks. However, despite the recommendation in healthy eating guidelines to eat a varied diet, there is as yet no recognized way of defining or measuring dietary variety, nor of quantifying the risk involved in not achieving it. Such methods as have been used are discussed in Myatt and Dowler (1995). In the survey analysis, food variety was characterised using ideas developed from techniques of biologists and ecologists interested in species diversity and abundance, or variety and frequency (Myatt and Dowler, 1995). A series of Variety Frequency Scores were developed from responses to a food frequency questionnaire such that "more foods eaten more often" gave high VFS; "fewer foods overall", or "fewer foods eaten less often" gave low VFS, with

appropriate gradations in between. Details of the analytical procedures are given in appendix 2.

There are no cut-offs to identify adequate or inadequate variety; in this survey the VFS were simply used to quantify dietary diversity of different groups in the sample. The assumption was that those with higher diversity had a lower health risk, and vice versa.

c) *healthy dietary patterns:*

three indicators were used: a Healthy Diet Score; the likelihood of eating five or more fruits and vegetables a day; and the % energy from fat and saturated fat. The higher the Healthy Diet Score, a fruit and vegetable score of "five and over", and the lower the % energy in the diet from total fat and saturated fat, the healthier the diet.

A "healthy" dietary pattern in theory enables an individual to meet all the COMA nutrient and variety guidelines.

Healthy Diet Score (HDS): There is not much experience in measuring "healthy dietary patterns". On Myatt's advice, the food frequency data were used; each food listed was crudely scored as "+1", "-1", or "0", in terms of whether or not current healthy eating guidelines recommend eating more of it, less of it, or are neutral about it. This ranking was combined with the Variety Frequency Scores to produce a Healthy Diet Score for each parent and for their child/ren. "Recommended" foods eaten more often, contributed most to the HDS; "go easy" foods eaten more often, reduced the HDS. Thus the HDS was more likely to be high and positive if most of the foods people ate regularly were those that healthy eating guidelines recommend eating, and more likely to be negative if most of the foods people ate regularly were those that healthy eating guidelines recommend reducing. As with the VFS, any risk attached to high or low HDS was not quantified; the HDS were simply used to rank groups in the sample in terms of the likelihood they consumed a healthy dietary pattern.

five fruits and vegetables a day: Current "healthy eating" advice is that people should eat more fruit and vegetables each day than many presently do (DH, 1994a; Williams, 1995). The responses for fruit and vegetables in the FFQ were used to calculate the probability that parents and children were eating at least five different fruits or vegetables a day. Details are given in appendix 2. Fruit juice and pulses were excluded from the indicator: juice reporting in the FFQ was not always reliable (whether respondents distinguished fruit "juice" from "drinks" or "squash") and pulses, although rich in non-starch polysaccharide, do not provide significant amounts of antioxidant vitamins. Potatoes and chips were also excluded in line with current advice, on the grounds that they are eaten as a starchy staple (Williams, 1995).

% of energy as fat and as saturated fat: The population average fat intake should provide no more than 33% of daily total energy intake, or 35% daily food energy (excluding alcohol) and average saturated fat no more than 10% of daily total energy intake, or 11% daily food energy intake, to achieve a healthy diet (DH, 1991). The proportions of each individual's energy intakes obtained as fat and saturated fat were calculated from the dietary intake data.

Methods for collecting nutrition data: dietary survey

The aim was to measure each individual's nutrient intake in each lone parent household using a weighed intake technique. The method pioneered by Nelson and Nettleton (1980), a combination of weighed intakes with calibrated household measures, was adapted. Seven days of measurement was deemed unrealistic in a sample of lone parent households, which might contain only one literate adult. Three days' intakes were measured as a reasonable compromise: sufficient to estimate mean intakes of energy and the majority of nutrients of interest, yet not too long to tax the patience and compliance of respondents (McBride *et al.*, 1990). Estimates of habitual intake of some nutrients, such as vitamin A (found in a few foods in very high concentrations), may have been less reliable than for energy and nutrients found in many foods.

Nutrition in lone-parent households: case study methods

Detailed intakes of all household members were recorded individually for three days, including a weekend day, using a specially designed logbook and Soehnle Gusto digital battery operated scales (weighing to 5kg in 2g gradations, with a good tare facility). Scales were regularly calibrated and serviced. The first page of the logbook "example day" and the recipe page are shown in appendix 1. The logbook was based on Nelson and Nettleton's (1980), adapted following pilot testing and with minor modification to include bulk weighing of spreading foods used regularly, and each individual's typical weights of milk and sugar in hot drinks. Apart from these few exceptions, each item of food and drink was described in detail and the amount eaten at one time and any leftovers were recorded in the appropriate columns. Respondents were asked to weigh what they ate as much as possible, including their individual servings of composite dishes, and to give details of ingredients and cooking methods for home prepared dishes. Each household member also had a small notebook to record food and drink eaten away from home. Children who could write were encouraged to use a notebook too; for younger children records that could not be kept by parents were maintained by child-minders, nursery staff, etc. Product packaging weights or household measures were used where weighing was difficult. People were encouraged to keep food packaging and sweet wrappers, to help product identification.

Dietary logbooks were collected and checked at the second interview, and any household member's illness while doing the survey noted. During the interview the respondent was asked whether any member was trying to control their weight, and if so, what they were doing specifically, and whether anyone was taking dietary supplements. These questions were partly intended as checks to the dietary survey, but were not associated with it by the interviewers (the questions came half-way through the long interview, in the context of health beliefs and practice) and no respondent made an explicit connection with the dietary survey in their answers.

Methods for collecting nutrition data: weight and height

Weight was measured to improve the choice of individual DRV. Height was measured to be able to calculate Body Mass Index (BMI: weight in kg/height in m²) for

respondents aged 16 and over. Both were recorded on the back page of the logbook. Body weight was measured using Soehnle digital scales (Model 7209/100g units) in kilogrammes, on a level surface and without shoes (Gibson, 1990). (Subjects were not asked to remove any clothing or empty their bladder first). Height was measured in metres using a retractable portable stadiometer (microtoise) against a wall (Gibson, 1990). If children were absent at school during the second interview, parents were asked for child/ren's weight(s) and height(s) if they knew them. These estimations or anecdotal measurements were only used to calculate the individual child's DRV categories; no analysis was done on weights or heights not measured by the interviewers.

Methods for collecting nutrition data: food usage frequency

A food frequency questionnaire (FFQ) was used, based on that used by Schofield, Stewart and Wheeler (Wheeler *et al.*, 1989) and the Caerphilly Study (Yarnell *et al.*, 1983) with some modification following pilot studies. The FFQ was designed to investigate within food group variety; it listed over 170 separate food and drink items within broad categories of cereals, meat, fish, vegetable, pulses/nuts/legumes, fats and spreads, dairy, sugars, jams and sweets, cakes and biscuits, take-away meals and alcoholic drinks. Foods more likely to be eaten by black British or Afro-Caribbean households, such as maize, couscous, cow peas, yam, sweet potato etc., were listed under the appropriate headings. Commonly eaten composite dishes revealed through the pilot study were included, particularly pizzas. Some foods were listed in some detail: different kinds of bread, 17 fruits, and 42 vegetables. Cakes, biscuits and sweet things were less individuated. The questionnaire is given in appendix 1.

For each listed food item the respondent was asked "How often do you/your children eat X?" Five possible responses (most days, once or twice a week, two or three times a month, occasionally, never) were discussed with the respondent before the FFQ began. Responses were recorded on the simple check-box style questionnaire (see appendix 1). The respondent answered separately for themselves and their child/ren. If they had more than one child, and there were marked differences in consumption

patterns among them, the perceived norm was recorded. The FFQ included a question to identify parents or children who were vegetarians. It took about 15-20 minutes to administer.

Methods for collecting social, demographic and economic data

Basic socio-demographic data were obtained from the first contact questionnaire, which is given in appendix 1. Respondents were invited to identify all household members; to provide a brief personal education, qualification and employment history; to identify their household income band (in £25s) from an income-band prompt card, and their housing and marital status. They were also invited to identify themselves ethnically from a prompt card listing ethnic groups as used in the 1991 census. There was some anticipation that respondents might be unhappy or reluctant to answer this question on ethnicity; to a large extent the anxieties proved unfounded, and only two people refused to respond. Criticism of the broad generalizations about ethnicity and its ready interchangeability with race or culture have been discussed in the medical and social literature (e.g. McKenzie and Crowcroft, 1994; Senior and Bhopal, 1994). This survey was about food: its management, consumption and cultural beliefs and practice. Ethnic cultural differences in approach or tradition seemed likely, and it was important therefore to distinguish parents of white Irish, white British, white (other) European, black British, African, Caribbean or other origins. The prompt card distinguished all these categories, although in practice most analyses to date have been done using just three ethnic categories (white; black African; black British/Caribbean) or two (white; black). People's origins or cultural influences (such as a former partner from Italy, or a father from Ghana) were also revealed during the long interview; these factors were not used in the present analyses.

Detailed information about income was obtained during the long taped interview, using Bradshaw and Millar's method (1991) (the full schedule is in appendix 1). A prompt card which listed all possible sources of income was shown, and respondents were asked to say how much they received net of tax and insurance from each, if any (the sources included older members' pensions, earnings of non-dependent children and

other adults where these contributed to the household's income). Fixed deductions for those receiving state benefits were noted, as were housing costs. Respondents were usually happy to give these details by the stage of the long interview reached; only one refused, and two could not give precise figures because their weekly circumstances were very variable.

Methods for investigating food beliefs and practices

During the long taped interview, eating and shopping patterns and decision-making, food and health beliefs and practices, and budgeting for food were investigated. A semi-structured schedule was used (see appendix 1), rather than unstructured coverage of thematic areas; that is, a series of largely open-ended questions with consistent wording were asked, to elicit personal, unguided responses. Verbal prompting was sometimes used, as far as possible in a consistent pattern from one interview to the next; written prompt cards were used for sources of income and items of household expenditure. Despite the semi-structured approach of this longer interview, the primary intention of the research was to measure nutritional conditions under different material and social circumstances; sample size and methods were thus dictated by the quantitative survey needs. In addition, comparability and consistency in questions and response were essential: there were two field workers doing the research over a year's timespan. The same wording was therefore used throughout all the interviews as far as possible.

The FFQ instrument had been intended as quantitative, but many respondents in fact treated it as qualitative, in that while answering they also explained how meals were constructed, what foods were bought to go with what, who ate what with whom and why. Much of this excellent anecdotal material was lost because there was no way of recording it at the time, although the field workers tried to make notes on the FFQ sheet, and often picked up specific elements during the subsequent taped long interview. This began with factual questions on cooking and storage facilities and usage; meal patterns, including take-away foods; and detailed shopping practices. Opinion was solicited after factual questions, e.g. "do you think you have enough

space to cook and store food?"; "are you happy with your facilities for cooking and storage?"; "why do you (shop there/not eat lunch, etc)?" In order to link these topics to a discussion of food and health two completely open-ended questions were used: "when you are buying food, what are you looking for? (what qualities/ characteristics)" and "what are your aims in feeding your family? (what are you trying to achieve?)". The answers given proved unexpectedly powerful in differentiating dietary patterns and were used in subsequent analysis (chapter 6).

The food and health questions were designed to elicit broadly what people knew of current "healthy eating" guidelines; what practices they said they followed to conform to advice, and what they encouraged their children to do; use of food labels; where people got advice or information (undefined) about food and health, what they thought about it, whether it was easy to follow and whether or not they did. Finally there were the questions already mentioned about the use of dietary supplements and weight anxieties.

Both field workers were from London University, and were accurately described to potential respondents by the DSS as nutritionists, so there was some anxiety on their part in designing this part of the schedule that respondents might find giving an honest opinion difficult, giving "public" rather than "private" accounts of food beliefs and practices. A number of strategies to counter these possibilities were adopted (Cornwall, 1984). Several issues were addressed using the format: a general question, which offered the possibility of agreement or disagreement; a specific question about their practice (what do you do?); a question about their views or feelings on the practice/ experience. Secondly, any or all of these questions were prefaced by "some people think/say/ do x, others y - what do you think/do?" to allow people to be radical or take a middle view, or to disagree with what they might feel to be a consensus view. Thirdly, all these questions were asked at the second or third contact, often after about half an hour of interviewing. They also followed the dietary survey and FFQ, both of which mostly seemed to have interested respondents very much, and to have created at least the illusion of intimacy in the interview.

A more difficult problem is the one described by Blaxter:

"many people do have good diets, or exercise habits, or are non-smokers, without thinking of mentioning these when asked why their lives are healthy. [...] These patterns of behaviour are not necessarily motivated by health considerations. Alternatively, it is possible that lifestyles originally adopted with health seen as partly relevant - eg the decision not to smoke - may become routine and 'normal', and do not continue to be seen as active health practices. [...] People do not, on the whole, appear to attempt to deceive, but there are high proportions of 'false negatives'" (Blaxter, 1990, p174).

The only solution adopted, following the pilot interviews, was to approach ideas about "healthy eating" practices several times, from slightly different perspectives, so that respondents had more than one opportunity to elaborate dietary practices; they could concentrate on different aspects each time, as they chose, yet their views would still be recorded and an attempt to identify a totality of views could be made at any qualitative analysis stage.

Methods for investigating budgeting in relation to food

A second prompt card was used to find out which main items of household expenditure applied to the respondent; additional items were noted. Respondents were not asked how much they actually spent on the different categories (fuel, clothing, telephone, etc), only how they organized payment for each item. This led to asking if anything was difficult to pay for, with some discussion of general budgeting strategies. Respondents were then asked to estimate how much he or she spent each week on food, including small daily purchases but excluding what was spent on household goods. The figures obtained were respondents' approximations, rather than actual records for a given period, although some specific prompting was possible because food shopping patterns had been detailed. People were asked whether or not they (or their children) smoked, and roughly how much they spent on cigarettes.

These questions led to a discussion of what people did when money was short as regards food. These questions were as straightforward and unambiguous as they could be, to try to elucidate what people on low incomes actually do in relation to food purchase, meal construction, food storage and distribution. People are sensitive to

hints of mismanagement where food is concerned, and were usually keen to elaborate their strategies. Many lived on so tight a budget they found it difficult to distinguish what they did "when short of money". Towards the end questions were asked about whether people ever ran out of money for food, and if so, what they did about it; whether they themselves, or their children, were ever hungry but did not eat because they could not afford to. The final questions were about social and family networks in relation to general budgeting, food budgeting and meals.

Data entry and analysis

The first contact questionnaire and FFQ were coded directly on to the questionnaires. The long interviews were taped; field workers subsequently listened to the tapes and completed a coding sheet derived from the pilot survey. Where, as occasionally happened, the respondent refused permission to tape, the coding sheet was completed by the field worker immediately after the interview, from memory and occasional notes. Answers which did not fit the precoded responses were written out in spaces provided. Subsequently, new codes were derived for many of these unanticipated responses; this further coding was particularly important for the questions on methods of paying bills. Much of the narrative data were thereby captured as quantitative responses and so used in the first round of analysis. Subsequently, a subsample of 30 of the 189 interviews obtained was selected for analysis of a more qualitative nature (189 was more than most qualitative researchers would consider necessary, or even appropriate for qualitative analyses).

Data entry for the first contact questionnaire, the FFQ and the quantitative coding for the longer interview was done in duplicate, with verification, using Epi-Info (Dean *et al.*, 1990) during June, July and August 1993, and transferred to SPSS (Norusis/SPSS Inc, 1990) for analysis. Household income data were calculated from the long interview prompt card responses, and adjusted for household size and composition using the McClements (Social Trends, 1995) and other scales (see appendix 3). The estimated amount spent on food per week for the household was adjusted by food equivalizing ratios on a similar principle to Consumption Units (Wheeler, 1991)

(appendix 3). The reciprocal of income and food expenditure data was used in analysis as continuous and categorical variables. Despite these transformations, the data remained highly positively skewed.

Data entry for the dietary survey was done between January and September 1993 by an experienced nutritionist who had not done the field work. The logbooks were coded as they were collected and entered using COMP-EAT 4 (Lifeline Nutritional Services, undated); the FFQ was used to clarify ambiguities. A number of technical issues were resolved, and are described in appendix 2. COMP-EAT 4 uses the McCance and Widdowson food composition database fourth edition (Paul and Southgate, 1978) and supplements (Holland *et al.*, 1988, 1989, 1991); additional food database material was added as necessary; details are given in appendix 2. COMP-EAT 4 provides individual profiles of daily mean energy and nutrient intake, and % UK DRVs (DH, 1991). The DRVs used were chosen for each individual on the basis of their gender, weight, age and activity level and are given in appendix 2. Where an individual's weight was not known, the UK mean for their age and gender was used. A link program between COMP-EAT 4 and SPSS (Norusis/SPSS inc, 1990) was written in dbase (Jones, 1990) and used to transfer the daily nutrients and % reference values for each individual to SPSS in October 1993. All further checking and analysis was done in SPSS; details of procedures are given in appendix 2.

Indicators of poverty

Several poverty and deprivation indices were used in analysis, including: household income, receipt of means-tested benefit (Income Support or Family Credit), occupationally based social class, unemployment, and housing tenure. A number of composite indexes of poverty similar to those used by Mack and Lansley (1985), Townsend *et al.*, (1987) and Marsh and McKay (1994) were also created. Those that proved most robust and suitable were:

A material poverty index, which was created from home ownership, length of time in poor financial circumstances, being in paid work, having a holiday once a year

(however limited) and having housing¹ or fuel costs automatically deducted or on a key meter. People could be in either category A: those in local authority or private rented housing who had had no job or holiday for more than a year; or in category B: those with housing and/or fuel deducted automatically from their benefits, or on a fuel key meter (many of whom were also paying a higher rate to recover arrears); or they could be in both categories. This gave three grades of the material poverty index:

0 = not in either category

1 = in one category (A or B) only

2 = in both categories (A and B)

A food poverty index, which related to people's experience of money and food shortages. It was created from whether or not respondents said they skipped meals because they had insufficient money, or used food from their stores (cupboard, 'fridge, freezer) because they had no money for food, and actually ran out of money for food, on a regular basis². Those who answered "yes" to all three conditions were counted as materially poor with regard to food.

A food anxiety poverty index, which related to people's own perceptions of having enough money for food. It was created from whether or not respondents felt they could afford to eat as much fresh food, or give their children as much fresh food, as they wanted to, and whether they worried about running out of money for food. Those who answered "no" to the first two and "yes" to the third conditions were counted materially poor with regard to fresh food.

¹ Some people, when they were going through the expenditure prompt card, said they had their housing costs deducted automatically from their benefit. In fact, almost all these respondents were receiving housing benefit. Automatic deductions were probably water charges or arrears (of rent, community charge or council tax, or repaying social fund loans).

²The field workers tried not to put words into people's mouths. People were asked "do you ever skip meals?"; those who answered "yes", were asked why and how often. Only those who volunteered skipping meals regularly because they didn't have enough money, or were trying to conserve what money they had, were included in this index. Likewise, only those who volunteered they regularly used their food stores because of insufficient money to last the week, were included.

Further details of methods and analysis are given in Appendices 1, 2 and 3.

Summary:

This chapter has summarized the indicators used to assess nutritional conditions in lone-parent households and has detailed the methods used to measure and investigate them. The next chapter presents the main quantitative findings.

Chapter 5 NUTRITION IN LONE-PARENT HOUSEHOLDS: NUTRITIONAL RESULTS

In the previous two chapters the process of drawing a sample of lone-parent households, what data were collected and how, and the socio-demographic characteristics of the sample contacted, were described. The questionnaires and details of data entry and manipulation procedures are given in appendices 1, 2, and 3. This chapter presents the results of weighing and measuring respondents and of analysing nutrient intakes and dietary patterns: the nutrition outcome indicators. There were no differences in demographic factors between the child benefit and Income Support samples and the two were combined for analysis. The factors shown in figure 1.1 (chapter 1) were used to generate a number of hypotheses about what affects nutritional outcomes. A number of independent variables had been measured: eating and shopping patterns and practice, food and health beliefs and practice, income and socio-economic circumstances, and budgetary coping strategies and indicators of poverty created; these were described in chapter 4. The relationships, if any, between the nutrient outcome indicators also described in chapter 4 and these independent variables were explored using a variety of methods (see appendix 2) to test the hypotheses.

Anthropometric indicators

Weight and height data were measured at the second interview when children were often at school or otherwise absent; only 32 children were measured, too few to draw any conclusions about child growth. BMI was calculated for 154 parents. BMI is an index of body size in adults related quantitatively to mortality (Waller, 1984) which is used as an indicator of both anorexia/underweight and obesity (Gregory *et al.*, 1990). Mean BMI of female parents was 25.1 (se 0.43), with a range of 17 to 44. The distribution of BMI and table of results are in appendix 4. There was no relationship between BMI and ethnicity, smoking, or any socio-economic indicator, and only a weak correlation with age ($r=0.186$; $r^2=0.03$; $p=0.022$). There was no relationship with age when the sample was divided in half, at 35 years, or in quartiles. There was no relationship between BMI and intake of any nutrients; nor whether or not respondents said they were dieting; nor whether or not the respondent completed a usable dietary

record. Thus there was no evidence that those who were obese had been less likely to keep the records.

Nutrient intake adequacy

Dietary data were available for 126 women and 5 men; 108 girls and 88 boys. There were no differences in nutrient intakes between those who started the survey on Thursday, and those who started on Sunday, and no difference between the mean intakes for Thursday + Friday vs Saturday, nor Monday + Tuesday vs Sunday. The mean of three days was therefore used for the total sample together. There were few seasonal differences in nutrient consumption, and correction for season had no effect on analysis. There were no differences in nutrient intakes between those who said in the long interview they were trying to control their body weight in a general way, or those who were actively dieting, and the rest of the sample, except that the "active" weight controllers had lower energy % DRV (ie, they seemed to be achieving what they hoped, which was to eat less energy than their current body weight required). "Dieting" does not account for results described below.

Results are shown for energy, non-starch polysaccharide (NSP) and nine nutrients considered important indicators of dietary quality, and whose levels would have been measured with reasonable precision over three days. They are presented first for whole sample, then to show age and ethnic differences. Differences in nutrient adequacy (% DRV as discussed in chapter 4) associated with income and other socio-economic indicators are described, with the parents' data are shown first, then those of dependent children. Finally, mention is made of other factors, particularly budget and food management strategies, which were associated with low intakes of four nutrients: iron, NSP, folate and vitamin C.

Nutrient intakes and their adequacy as % DRV per day are given for the whole sample of lone parents in table 5.1. The table indicates that lone parents' mean intakes of nutrients and energy were reasonable, with the exception of non-starch polysaccharide (NSP) and iron intakes, whose levels, while low, are nonetheless similar to national

average intakes (Gregory *et al.*, 1990). Table 5.2 shows nutrient intake data from the Adult Nutrition Survey for all women and for (female) lone parents. Fat intakes were no higher in lone-parent households than in the general population. In subsequent tables in this chapter the nutrient adequacy indicator is used, i.e. % reference value (% DRV), except for energy, total fat and NSP, where kcals or grams per day are shown.

table 5.1 lone parents: energy and nutrient intakes, % Dietary Reference Values

<i>nutrient</i>	<i>female n=126 mean intake (se)</i>	<i>female %DRV</i>	<i>male n=5 mean intake (se)</i>	<i>male %DRV</i>	<i>all parents %DRV</i>
energy	1792 kcals/7.49 MJ (46.6/0.19)	85	2288 kcals/9.56 MJ (297/1.24)	82	85
protein	66.5 g (1.8)	148	86 g (9.0)	155	148
total fat	78.4 g (2.43)	na	98.2 g (15.8)	na	na
NSP	10.5 g (0.42)	59	10.7 g (2.42)	60	59
iron	10.2 mg (0.36)	73	12.5 mg (0.72)	144	76
calcium	700 mg (26.3)	100	790 mg (123.2)	113	100
zinc	7.7 mg (0.26)	111	11.8 mg (1.94)	125	111
folate	190 µg (7.6)	95	244 µg (43.1)	122	96
vit A (ret. equiv.)	631 µg	105	537 µg	77	104
vitamin C	44.1 mg	110	67.8 mg	170	112
vitamin E	5.3 mg	175	4.3 mg	108	172

Dietary Reference Values in appendix 2; NSP=non-starch polysaccharide, ret.equiv.= retinol equivalent; na=not applicable

Figures shown are the arithmetic mean of nutrients and % DRV, except fat, for which g/day are only given, with standard error in brackets, taken from ONEWAY or ANOVA. For vitamins A, C, and E the geometric mean is shown and no standard error can be presented.

There were few differences in intakes by age among female lone parents; only simple regression and ANOVA using age in two categories (younger than 35 years; 35 and above) showed weak differences in NSP, calcium and vitamin C intakes; the data are given in appendix 4.

table 5.2 British women: energy and nutrient intakes

<i>nutrient</i>	<i>all women (n=1110)</i>	<i>unemployed (n=57)</i>	<i>benefit recip (n=153)</i>	<i>soc cl IV & V (n=222)</i>	<i>lone mothers (n=76)</i>
energy (kcal)	1,680	1,640	1,560	1,580	1,580
protein (g)	62.0	56.5	55.6	57.3	56.3
fat (g)	73.5	71.9	67.7	69.6	69.9
fibre (g)	18.6	17.7	16.8	16.9	16.1
iron (mg)	12.3	10.4	11.8	11.6	11.5
calcium (mg)	730	642	636	660	605
zinc (mg)	8.4	7.5	7.4	7.7	7.5
folate (µg)	219	190	192	196	199
vit A (ret equiv; µg)	1,488	1,003	1,328	1,217	1,206
vitamin C (mg)	73.1	72.1	55.4	55.8	55.8
vitamin E (mg)	8.6	7.1	7.5	8.2	7.3

data from Gregory *et al.*, 1990; figures shown for vitamins A, C and E are arithmetic means.

Respondents had been asked to identify their own ethnicity in broad categories to test the assumption that different food cultural preferences might produce with different dietary patterns, although few published data on "Afro-Caribbean" nutrient intakes existed at the time of the survey. Nutrient intakes for female "black African/British/Caribbean" parents combined are shown in table 5.3, with intakes of "white European" parents (which included Spanish and Irish). Black parents had higher intakes and dietary adequacy of energy, protein, NSP, iron, zinc and vitamin C. The trend was similar for all other nutrients examined. In fact, black African women tended to have healthier nutrient profiles than white Europeans; black Caribbean/British women had diets of intermediate quality.

table 5.3 female lone parents: energy, fat and NSP intakes, % Dietary Reference Values by ethnicity

<i>nutrient (se)</i>	<i>"black" Brit/ Carib/Afr n=31</i>	<i>"white" European n=94</i>	<i>p value ANOVA</i>
energy kcals	2,048 (119)	1,718 (51)	0.0032
energy %EAR	97 (4.9)	82 (2.5)	0.0053
protein %RNI	174 (9.4)	140 (43.3)	0.0003
total fat g	84.0 (6.0)	77.0 (2.7)	ns
iron %RNI	89 (7.2)	69 (3.1)	0.0041
NSP g	12.3 (1.04)	10.0 (0.50)	0.0323
NSP %EAR	69 (5.8)	56 (2.6)	0.0303
calcium %RNI	103 (7.4)	99 (4.5)	ns
zinc %RNI	133 (9.4)	105 (3.9)	0.0017
folate %RNI	105 (7.5)	93 (4.6)	ns
vit A (ret.equiv.) %RNI	113	105	ns
vitamin C %RNI	166	97	0.0083
vitamin E %safe intake	196	172	ns

Dietary Reference Values in appendix 2; NSP=non-starch polysaccharide; ret.equiv.= retinol equivalent; ns=not significant

Figures shown are the arithmetic mean of % DRV for nutrients except fat, for which g/day are given, with standard error in brackets, taken from ONEWAY or ANOVA. For vitamins A, C, and E the geometric mean is shown and no standard error can be presented.

Nutrient intakes of dependent children are presented as % DRV, except for NSP for which no child DRV exists, to correct for age. Data are shown for the whole sample in table 5.4 and in age groups in table 5.5. They indicate that children's intakes of nutrients and energy were reasonable, with the exception of children over 10 years. The national survey of toddlers' diet and nutrition (Gregory *et al.*, 1995) found intakes in lone-parent households to be no worse than in two parent households except for vitamin C and total carotene. As expected, in this survey girls in general were less likely to exceed 100% RNI for iron than boys; nonetheless, their average levels (table 5.4) were not particularly low. There was no significant difference in energy as a % DRV among children of different ages; fat intakes were higher in each successive age group; intakes of protein, iron, calcium and folate intake was lowest among children over

table 5.4 dependent children: NSP intakes, % Dietary Reference Values

<i>nutrient (se)</i>	<i>all children n=196</i>	<i>females n=108</i>	<i>males n=88</i>	<i>p values (ANOVA)</i>
energy %EAR	102 (1.8)	106 (2.8)	98 (2.1)	ns
protein %RNI	220 (6.8)	209 (9.7)	234 (9.0)	ns
iron %RNI	111 (3.4)	97 (4.3)	128 (4.8)	0.0001
NSP g	10.3	9.8 (0.47)	10.9 (0.56)	ns
calcium %RNI	126 (4.5)	121 (6.1)	132 (6.8)	ns
zinc %RNI	100 (2.7)	96 (3.5)	105 (4.1)	ns
folate %RNI	158 (6.1)	151 (8.9)	168 (8.0)	ns
vit A (ret.equiv.) %RNI	118	109	130	ns
vitamin C %RNI	204	210	199	ns
vitamin E %safe intake	181	201	159	0.0029

Dietary Reference Values in appendix 2; NSP=non-starch polysaccharide, ret.equiv.= retinol equivalent; ns=not significant

Figures shown are the arithmetic mean of % DRV for nutrients except fat, for which g/day are given, with standard error in brackets, taken from ONEWAY or ANOVA. For vitamins A, C, and E the geometric mean is shown and no standard error can be presented.

10 years old. This result may reflect older children keeping less reliable records than younger (they were more likely than younger to keep their own record, and possibly less likely to record snacks). However, since energy intakes were not lower, the finding may be indicating that older children were eating diets of lower nutrient density, particularly for protein, iron, calcium and folate, than younger children.

There were significant differences in children's nutrient intake as % DRV by ethnicity. As table 5.6 shows, energy, iron, zinc and vitamin C were significantly higher in black households compared with white; the trend for most nutrients was similar to that observed in adults.

table 5.5 dependent children: fat, NSP intakes, % Dietary Reference Values, by age

<i>nutrient (se)</i>	<i>< 5 years n=58</i>	<i>5-10 years n=58</i>	<i>>10 years n=80</i>	<i>p values (ANOVA)</i>
energy %EAR	109 (4.3)	100 (2.8)	99 (2.2)	ns
protein %RNI	280 (14.6)	242 (10.7)	161 (4.8)	0.00005
total fat g	54.8 (2.8)	74.8 (2.6)	91.7 (2.9)	0.00000
iron %RNI	120 (6.4)	128 (6.1)	92 (4.5)	0.00005
NSP g	6.3 (0.48)	10.7 (0.44)	12.8 (0.59)	0.00005
calcium %RNI	166 (9.1)	139 (7.9)	87 (3.5)	0.00005
zinc %RNI	98 (5.1)	103 (4.9)	99 (4.2)	ns
folate %RNI	210 (13.9)	157 (9.2)	122 (6.1)	0.00005
vit A (ret.equiv.) %RNI	136	119	106	ns
vitamin C %RNI	221	191	204	ns
vitamin E %safe level	179	161	196	ns

Dietary Reference Values in appendix 2; NSP=non-starch polysaccharide; ret.equiv.= retinol equivalent; ns=not significant

Figures shown are the arithmetic mean of % DRV for nutrients except fat, for which g/day are given, with standard error in brackets, taken from ONEWAY or ANOVA. For vitamins A, C, and E the geometric mean is shown and no standard error can be presented.

The adequacy of parents' intakes was examined in relation to indicators of socio-economic status, such as social class and educational qualifications. As expected from other surveys, those in lower socio-economic categories in general had lower micro-nutrient intakes and smokers had lower intakes of iron, folate, vitamin E and (particularly) vitamin C. The relationship with income was tested using a number of variables¹ in regression (continuous) and ANOVA (categorical). The regression

¹Continuous variables: total household income, income per head, income per "number eating from the purse", equivalized income (see appendix D), equivalized amount spent on food; categorical variables: total and equivalized income in quartiles. In each case, variables were produced using income calculated before and after housing costs had been deducted (Social Trends, 1995).

table 5.6 dependent children: NSP intakes, % Dietary Reference Values by parents' ethnicity

nutrient (se)	"black" Brit/ Carib/Afr n=42	"white" European n=143	p value (ANOVA)
energy %EAR	113 (4.8)	99 (2.0)	0.002
protein %RNI	241 (17.3)	216 (7.5)	ns
iron %RNI	126 (7.4)	108 (3.9)	0.027
nsp g	11.5 (0.95)	10.1 (0.39)	ns
calcium %RNI	142 (11.3)	122 (4.9)	ns
zinc %RNI	113 (6.4)	98 (3.0)	0.026
folate %RNI	175 (11.5)	155 (7.5)	ns
vit A (ret. equiv.) %RNI	140	114	ns
vitamin C %RNI	296	183	0.002
vitamin E % Safe Intake	193	176	ns

Dietary Reference Values in appendix 2, NSP=non-starch polysaccharide, ret.equiv.= retinol equivalent; ns=not significant

Figures shown are the arithmetic mean of % DRV for nutrients except fat, for which g/day are given, with standard error in brackets, taken from ONEWAY or ANOVA. For vitamins A, C, and E the geometric mean is shown and no standard error can be presented.

results were significant and negative for iron ($p < 0.002$ total income; $p < 0.01$ equivalized income), NSP ($p < 0.02$, both), folate ($p < 0.02$ total income; $p < 0.005$ equivalized income), and vitamin C ($p < 0.01$ total income only), but in each case the correlation coefficient and goodness of fit were low (coefficient = 0.3; $r^2 = 0.08$). Household income itself was thus a poor predictor of nutrient ~~intakes~~ in this survey, possibly because the distribution was very skewed: there was insufficient variation in the sample to show predictive power. In multiple regression, being in receipt of Income Support and the *material poverty index* (chapter 4) were much more powerful predictors of nutrient ~~intakes~~ than income alone.

Table 5.7 shows nutrient adequacy by receipt of Income Support, the indicator used to identify Low Income Families (chapter 1).

table 5.7 lone parents: energy, fat and NSP intakes, % Dietary Reference Values by receipt of Income Support

<i>nutrient (se)</i>	<i>Income Support n=85</i>	<i>no Income Support n=41</i>	<i>p value ANOVA</i>
energy kcals	1,743 (55)	1,895 (85)	ns
energy %EAR	84 (2.8)	88 (3.6)	ns
protein %RNI	144 (4.8)	154 (7.4)	ns
total fat g	77 (2.8)	81 (4.8)	ns
iron %RNI	65 (2.7)	89 (6.2)	0.0001
NSP g	9.7 (0.45)	12.3 (0.9)	0.0042
calcium %RNI	98 (4.8)	103 (5.8)	ns
zinc %RNI	107 (4.4)	118 (6.8)	ns
folate %RNI	90 (4.3)	107 (7.4)	0.0317
vit A (ret.equiv.) %RNI	96	129	ns
vitamin C %RNI	94	155	0.0047
vitamin E %safe level	162	206	0.0180

Dietary Reference Values in appendix 2; NSP=non-starch polysaccharide; ret.equiv.= retinol equivalent; ns=not significant

Figures shown are the arithmetic mean of % DRV for nutrients except fat, for which g/day are given, with standard error in brackets, taken from ONEWAY or ANOVA. For vitamins A, C, and E the geometric mean is shown and no standard error can be presented.

Energy intakes of those claiming Income Support were no different from those not, but adequacy of iron, NSP, folate, vitamins C and E was significantly lower for claimants, NSP and iron intakes being particularly low. Indeed, 43 female lone parents had intakes below the lower reference point (LRNI, i.e. almost certainly insufficient for health), of whom 37 were claiming Income Support ($p<0.001$). The timing of benefit collection and the dietary record was investigated by weighted regression. Parents whose diets were measured four or more days after they had collected their Income Support had lower energy, iron, NSP, folate and vitamin A as a %DRV than parents whose diets were measured within one or two days of collecting their benefit: i.e. the further from benefit collection day, the worse the parent's diets.

Nutrition in lone-parent households: nutritional results

Analysis of nutrition outcomes using the *material poverty index* (which takes account of the length of time on Income Support and whether money is deducted from it) gave even sharper differentials. Table 5.8 shows that those who had been unemployed and

table 5.8 lone parents: fat and NSP intakes, % Dietary Reference Values by the *material poverty index**

nutrient (se)	poverty index=0 n=59	poverty index=1 n=35	poverty index=2 n=24	p value ANOVA
protein %RNI	158 (6.2)	143 (6.5)	127 (7.6)	0.0121
total fat g	83 (3.5)	77 (4.2)	70 (5.1)	ns
iron %RNI	90 (4.5)	66 (4.3)	56 (4.6)	<0.0001
calcium %RNI	111 (5.6)	93 (5.7)	83 (7.6)	0.008
NSP %EAR	66 (4.6)	54 (6.9)	44 (8.1)	0.0004
zinc %RNI	122 (5.9)	106 (6.0)	96 (7.7)	0.0197
folate %RNI	114 (6.4)	83 (4.3)	76 (6.5)	<0.0001
vitamin C %RNI	149	101	74	0.0022
vit A (ret.equiv.) %RNI	129	99	79	0.0275
vitamin E %safe intake)	188	168	148	ns

* **Poverty Index:** those in categories A or B, or in both. Category A = those in LA/private rented housing, with no job, no holiday, for more than 1 year. Category B = those with rent/fuel automatically deducted or on a key meter

Poverty Index

0 = not in either category

1 = in one category (A or B) only

2 = in both categories (A and B)

claiming benefit for more than a year, who live in rented or local authority housing, had less adequate intakes than those not in these conditions, particularly where money was taken off benefits to pay debts or arrears, or where fuel bills were paid through a key meter. The coincidence of circumstances produced the worst outcomes: nutrient intakes as % DRV were considerably below those of parents not living in such circumstances. There were no differences in energy or fat intakes.

There were few differences in nutrient adequacy in relation to the *food poverty index* (see chapter 4); by contrast, as shown in table 5.9, the *food anxiety poverty index* was associated with differences in nutrient adequacy. Asking people whether or not they think they can afford to buy enough fresh food, and whether they worry about running out of money for food, seemed to be quite good markers of nutrient adequacy.

table 5.9 lone parents: energy, fat and NSP intakes, % Dietary Reference Values, by the *food anxiety poverty index**

nutrient (se)	<i>anxiety=yes</i> <i>n=33</i>	<i>anxiety=no</i> <i>n=86</i>	<i>p value</i> (ANOVA)
energy kcals	1,546 (74.6)	1,958 (89.5)	0.0008
energy %EAR	74 (3.7)	92 (4.4)	0.0043
protein %RNI	129 (6.5)	151 (7.7)	0.0351
total fat g	69.6 (4.32)	85.7 (4.57)	0.0133
iron %RNI	68 (5.3)	83 (6.1)	ns
nsp g	8.5 (0.65)	11.6 (0.71)	0.0024
calcium %RNI	87 (7.4)	113 (7.0)	0.0146
zinc %RNI	103 (6.4)	115 (7.0)	ns
folate %RNI	74 (5.5)	112 (8.3)	0.0003
vit A (ret.equiv.) %RNI	82	130	0.0150
vitamin C %RNI	59	169	0.0006
vitamin E %safe level	153	169	ns

* food anxiety poverty index those who when asked whether they could afford enough fresh food for themselves or their children, said "no", and whether they worried about running out of money for food, said "yes".

The relationship between nutrient adequacy, smoking and the *material poverty index* (categories 1 and 2 combined) is shown in table 5.10 for iron, folate, vitamin C and NSP.

table 5.10 lone parents: % Dietary Reference Values for iron, folate, vitamin C and NSP intakes of smokers and non-smokers by the *material poverty index**

<i>nutrients</i>	<i>smokers/ non-smokers</i>	<i>poverty index 0 (n=15/44)</i>	<i>poverty index 1 and 2 (n=30/29)</i>	<i>ANOVA p values</i>
iron (% RNI)	smokers	73	58	poverty p<0.0001
	non-smokers	96	66	smoking (0.009)
folate (% RNI)	smokers	102	72	poverty p=0.001
	non-smokers	119	89	smoking p=0.037
vitamin C (% RNI)	smokers	123	62	poverty p=0.007
	non-smokers	159	130	smoking p<0.002
NSP (% EAR)	smokers	63	44	poverty p=0.001
	non-smokers	67	56	smoking NS (p=0.094)
NSP (total g)	smokers	11.4	7.9	poverty p=0.001
	non-smokers	12.1	10.1	smoking NS (p=0.084)

Dietary Reference Figures in appendix 2; NSP=non-starch polysaccharide.

Figures shown are the arithmetic mean of % DRV for each category of the poverty index except for vitamin C, where the geometric mean is shown.

**material poverty index*: (chapter 4) those in categories A or B, or in both.

category A = those in LA/private rented housing, with no job, no holiday, for more than 1 year.

category B = those with rent/fuel automatically deducted or on a key meter

- poverty index
- 0 = not in either category
 - 1 = in one category (A or B) only
 - 2 = in both categories (A and B)

For parents who smoked, being poor was associated with much reduced adequacy of vitamin C intakes, and slightly lower iron, NSP and folate intakes. For those who did not smoke, being poor was associated with lower iron and folate intakes.

There were no significant differences in adequacy of children's intakes by receipt of Income Support and only in adequacy of zinc, and vitamins A and C by the *material poverty index* (for instance, for vitamin C the group mean was always more than 100% DRV but adequacy was lower for each increase in the material poverty index: 251%; 182%; 169%, respectively). The % DRV achieved was consistently higher in

children's diets than in parents'. There was no association between parental smoking and adequacy of children's vitamin C intakes.

Twenty-four parents (18%) had nutrient intakes below the LRNI for one micronutrient; 26 (20%) were below for two or more micro-nutrients; intakes of 62% parents were above the LRNI for all nutrients. Those with very low nutrient intakes were not dieters and they were not anorexic (they did not have very low BMIs). There was no relationship with age or ethnicity. Very low nutrient intakes were strongly associated with poverty. Parents with intakes below the LRNI had lower weekly income than those whose intakes were not so low (£100 vs £159, Kruskal-Wallis $p < 0.0005$); those in the worst *material poverty index* category were twice as likely to have intakes below the LRNI for two or more nutrients than those not in either category ($p < 0.0015$), particularly if they smoked. There was no relationship with the poverty index and intakes below the LRNI for non-smokers.

Forty-three (22%) children sampled had nutrient intakes below the LRNI for one micronutrient; 7% for more than one nutrient; 77% children had no intakes below the LRNI. However, there were no differences in income between households where children had very low intakes from those where they did not. There was also no relationship with the poverty indices, nor with receipt of Income Support. There was no consistent pattern of parents and children whose intakes were below the LRNI: they were not always from the same households.

Intakes of iron, NSP, folate and vitamin C:

Further details of analyses are presented for iron, NSP, folate and vitamin C, chosen to illustrate a range of nutrients in poor households. Women's iron intakes are low generally in the UK (Gregory *et al.*, 1990), particularly in poorer households. Non-starch polysaccharide (NSP) was chosen because in fact few people in the UK eat as much as is recommended for health (Gregory *et al.*, 1990), and again, intakes are said to be low in poor households. Folate intakes are often low among those who tend to subsist on "tea and toast" with low fresh fruit and vegetable consumption. Smokers

are known to have low intakes of vitamin C (Margetts and Jackson, 1993), and are thought to have higher requirements than non-smokers. Poor lone mothers are more likely to smoke than women of similar age and income who have no children (Marsh and McKay, 1994). Vitamin C is also among the vitamins thought to play a role in protection against certain cancers and heart disease (DH, 1994a).

The main factors differentiating intake adequacy of iron, NSP, folate and vitamin C in fact were the *material poverty index* and, to a lesser extent, parental smoking, as described above. These and other variables associated with higher or lower adequacy are summarized in figure 5.1 (parents) and figure 5.2 (children) and discussed briefly below. In these figures, variables associated with higher adequacy are denoted by "+"; those associated with lower adequacy are denoted by "-". Neither the data nor significance levels are given in the figures, since these depend on which factors are put together, but the significance levels are given in appendix 5. The strength of associations is represented crudely by the number of "+" or "-". The mean % reference values is sometimes inserted in the text to illustrate summary statements.

Iron: The material poverty index was particularly important in differentiating parents' iron intakes; those who were poorest, spent least on food, and shopped exclusively in discount stores, had very low iron intakes² (7-8g/day; <60% DRV). Those who said they looked for "healthy" food when shopping had higher iron intakes than those who didn't mention that aim, but the relationship was not strong: poverty was more important. Black parents had better iron intakes than white, independent of smoking. Children from poorer white households had lower iron intakes (105% DRV) than those in black (126%) or richer (117%) households, particularly where rent or fuel were deducted automatically from benefits. These children tended to have younger parents. Few other factors differentiated adequacy of parental or child iron intakes.

² A three day survey of food intake might not measure habitual iron intake accurately if households are likely to eat liver or other meat with very high levels of iron, but not more than once a week. The food frequency questionnaire revealed that few in poorer households ate beef (other than mince, which is not as good an iron source and was eaten regularly, so would be picked up by a three day survey) and few in any households ate offal. Therefore three days would give a reasonable estimate of iron intakes in poor households.

figure 5.1 factors associated with lone parents' nutrient intake adequacy: iron, NSP, folate and vitamin C

+++ +/- --- most important factors associated with high/low adequacy
 + +/- - less important factors associated with high/low adequacy
 +/- least important factors associated with high/low adequacy
 0 no relationship

	<i>iron</i>	<i>NSP</i>	<i>folate</i>	<i>vitamin C</i>
material poverty index = 2	----	--	----	---
rent/fuel auto-deducted or by key meter	----	----	----	--
receiving Income Support	--	--	--	--
household weekly income	--	--	-	-
amount spent on food/week	---	0	-	0
ethnicity (being black)	++	0	+	+
age (being older)	+	0	0	+
not smoking	++	++	+++	++++
only shop in discount stores	--	--	---	---
skip meals because no money	0	--	---	0
fuel bills paid by key meter or stamps	--	-	--	--
using a catalogue for household goods	0	---	---	---
aiming at a healthy diet	+	++	0	0
looking for "fresh" food	0	0	0	0

Non-starch polysaccharide: Those who lived in the most difficult financial circumstances (*material poverty index*=2), had lower intakes (8.1g) than those who did not (11.5g), particularly if they also paid for household goods through a catalogue (6.6g), a practice almost entirely confined to Income Support claimants. Automatic housing cost deduction or using a key meter remained important when the amount spent on food, or being on Income Support, or smoking, were taken into account. These factors were also associated with lower adequacy in children's intakes.

NSP intakes also seemed sensitive to whether or not people voiced a concern for health in choosing food. Parents who said one of their aims in feeding their family was to achieve a healthy diet, even though they lived on Income Support, achieved NSP intakes of 11-12g, compared with 8.8g for those on Income Support who did not mention such an aim. A similar difference was seen in children's intakes, although in both instances only in households where people did not use a key meter for electricity

or gas, or buy stamps in advance to pay bills. The *food anxiety poverty index* also differentiated parents' NSP intakes (11.6g vs 8.5g; $p < 0.0024$).

figure 5.2 factors associated with children's nutrient intake adequacy: iron, NSP, folate and vitamin C

+++/- - - - most important factors associated with high/low adequacy
 + +/- - less important factors associated with high/low adequacy
 +/- least important factors associated with high/low adequacy
 0 no relationship

	<i>iron</i>	<i>NSP</i>	<i>folate</i>	<i>vitamin C</i>
material poverty index = 2	0	0	0	- - -
rent/fuel auto-deducted or by key meter	0	0	0	- - -
receiving Income Support	0	0	0	0
household weekly income	0	0	0	0
amount spent on food/week	0	0	0	0
ethnicity (being black)	0	0	0	+
parent's age (that they are older)	+	0	- -	0
parents' not smoking	0	+	0	(+)
only shop in discount stores	0	0	0	0
skip meals because no money	0	0	0	0
fuel bills paid by key meter or stamps	(-)	0	0	-
using a catalogue for household goods	0	0	0	0
aiming at a healthy diet	0	++	+	+
looking for "fresh" food	0	0	+++	+++

Folate: Those who had rent or fuel bills automatically deducted, or who used a key meter or stamps to pay bills, had lower intakes (78% DRV) than those who were not in these circumstances (106% DRV). Those who used a catalogue to pay for household goods or clothes also had lower folate intakes (78% DRV). None of these factors differentiated children's folate intakes, but children of older parents had lower folate intakes than those of younger (above and below 35 years) (133% DRV: 190% DRV).

As with NSP, those who were concerned about healthy foods seemed to make a difference to their children's diets. Children's folate intakes were higher (189% DRV)

in households where the respondent volunteered shopping for "fresh" food - that is, food of good quality, and not necessarily cheap - than in households where such an aim was not mentioned (146% DRV). The *food anxiety poverty index* differentiated parents' folate intakes (112% DRV: 74% DRV). Those who shopped exclusively in discount stores achieved only 79% DRV for folate, whereas those who also used the main supermarkets achieved 104% (117% if not claiming Income Support). Indeed, smokers who shopped in larger supermarkets did much better than those who shopped exclusively in discount stores. (There was no relationship between smoking and where people shopped, but almost all those using discount stores exclusively were Income Support claimants.)

Vitamin C: The three poverty indices were among the most important factors differentiating vitamin C intakes of parents and children. Younger smokers had lower vitamin C levels (92% DRV) than older smokers (135%); they also tended to be poorer. Those who used catalogues also had very much lower vitamin C intakes than those who didn't, particularly if they smoked (they only achieved 40% DRV as opposed to 147% for non-smokers). Younger women were more likely to use catalogues and to smoke, but age did not account for all the differences observed. None of these factors significantly affected children's intakes of vitamin C, although there were similar trends.

As with NSP and folate, there was evidence that those who looked specifically for "freshness" in food seemed to make a difference to their children's diets if not to their own. Adequacy of children's vitamin C intakes was higher (282% DRV: 186% DRV) among those whose parents looked for "fresh" food, even in the poorest households, and independently of parental smoking. Parents who shopped exclusively in discount stores had much lower vitamin C intakes (62% DRV) than those who used supermarkets as well (138% DRV), however poor they were (114% DRV). Nearly 60% of those interviewed used markets for fruit and vegetables, and 34% used them for meat and fish as well, sometimes in addition to supermarkets and discount stores. Using a

market for fruit, vegetables, meat or fish, made no difference to nutrient outcomes.

Dietary variety indicators

The relationships between VFS and a large number of independent variables were investigated, looking at overall food VFS, and VFS for types of food such as fruits, vegetables and cereals. The most important factors in parents' and children's diets associated with high VFS overall are summarized in figures 5.3 and 5.4. Figure 5.5 (parents) and figure 5.6 (children) show factors which were associated with higher fruit and vegetable variety combined. The data on which the figures are based are given in appendix 5. The factors shown as "most important" are those which were independently associated with high VFS; these are shown first in each figure. Factors which were independently associated with high VFS among demographic, socio-economic, cultural aspects and budgeting factors taken separately, are shown second, as "also important". Factors which were not independently associated with high VFS but which nonetheless showed some association on their own are shown as "less important". Factors which did not differentiate variety scores are not shown. None is in any particular order within the three categories. The procedures are described in appendix 5.

figure 5.3 factors associated with higher overall food variety in lone parents' diets

<p><i>most important:</i></p> <ul style="list-style-type: none">• ethnicity (being black)• looking for "freshness" when buying food• not being poor (material poverty index) <p><i>also important:</i></p> <ul style="list-style-type: none">• paying bills by direct debit• not choosing food just because children will eat it• using supermarkets, markets and specialist shops as well discount stores• not buying food just because it is "cheap"• looking for "healthy" food when shopping• not having a limited budget committed to rent, fuel, household goods (auto-deduction, key meters/stamps for fuel/etc, or catalogues) <p><i>less important:</i></p> <ul style="list-style-type: none">• not smoking

most important factors independently associated with high variety frequency scores.

also important factors independently associated with high variety frequency scores within demographic, socio-economic, cultural and budgeting variables.

less important factors not independently associated with high variety scores but which showed some effect on their own

factors are not in any particular order within the categories

factors which did not differentiate variety scores are not shown

figure 5.4 factors associated with higher overall food variety in children's diets

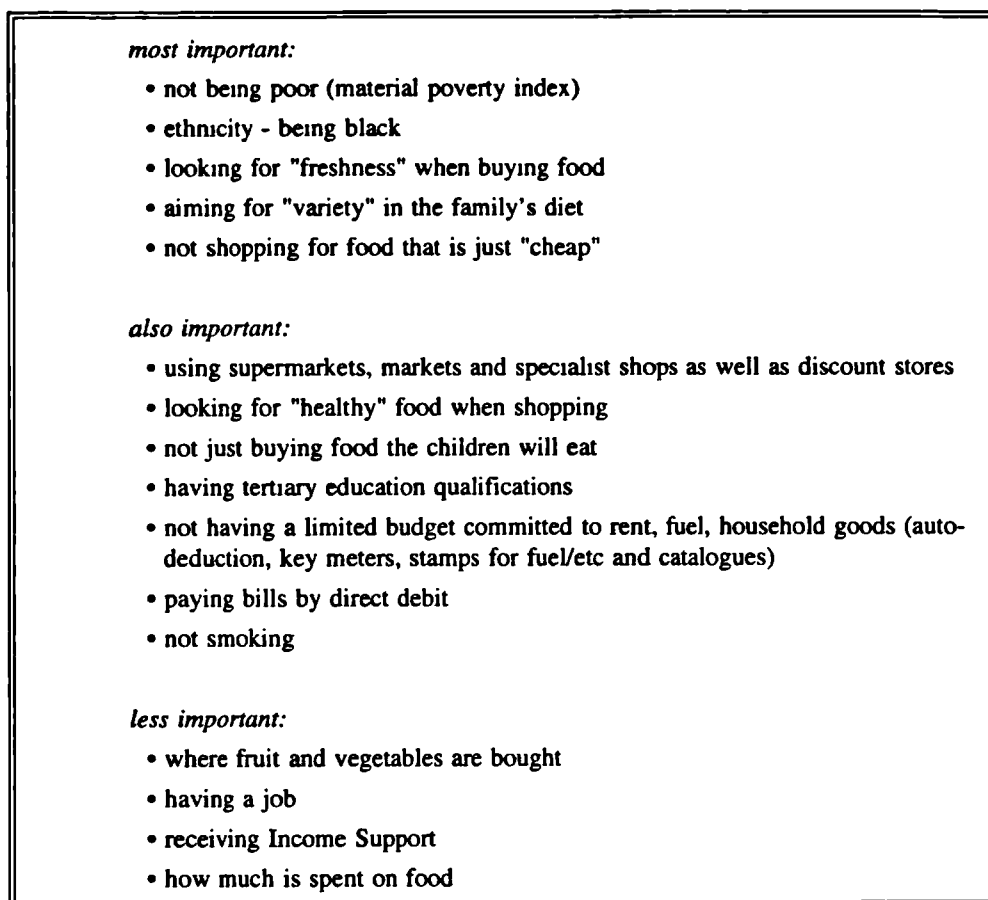
<i>most important:</i> <ul style="list-style-type: none">• having an older parent• having a parent who looks for "freshness" when buying food• ethnicity - having black parents
<i>also important:</i> <ul style="list-style-type: none">• not coming from a poor household (material poverty index)• having a parent who uses specialist shops for meat and fish• having a parent who doesn't buy food just because it is "cheap"

for explanation of terms, see figure 5.3

The material poverty index, ethnicity, and dietary aims were strongly and independently associated with high VFS for parents and children. There was a weak relationship with Income Support, and those who used catalogues for purchase of household goods had lower VFS, and their children had lower fruit and vegetable variety, than those who didn't use them. Lower VFS for parents was also associated with shopping exclusively in discount stores, a practice of the poorest, rather using a combination of discount stores, markets and supermarkets, or supermarkets exclusively. Those who were able to buy goods in bulk, ie less often, achieved more vegetable variety than those who bought ad hoc and often. Shopping patterns showed little association with children's dietary variety.

People's food aims were more strongly associated with the variety indices than with the nutrient indicators. Those who, when asked what characteristics they sought in food, said they looked for "freshness", or "healthy foods", or "variety", achieved higher scores in most indices, as did their children, than those who didn't mention these things. By contrast, those who said they looked for food that was "cheap" had lower variety scores for most indices. Finally, those who said they bought what they themselves or their children liked to eat, had less variety in their diets than those who didn't mention satisfying personal desires in food shopping.

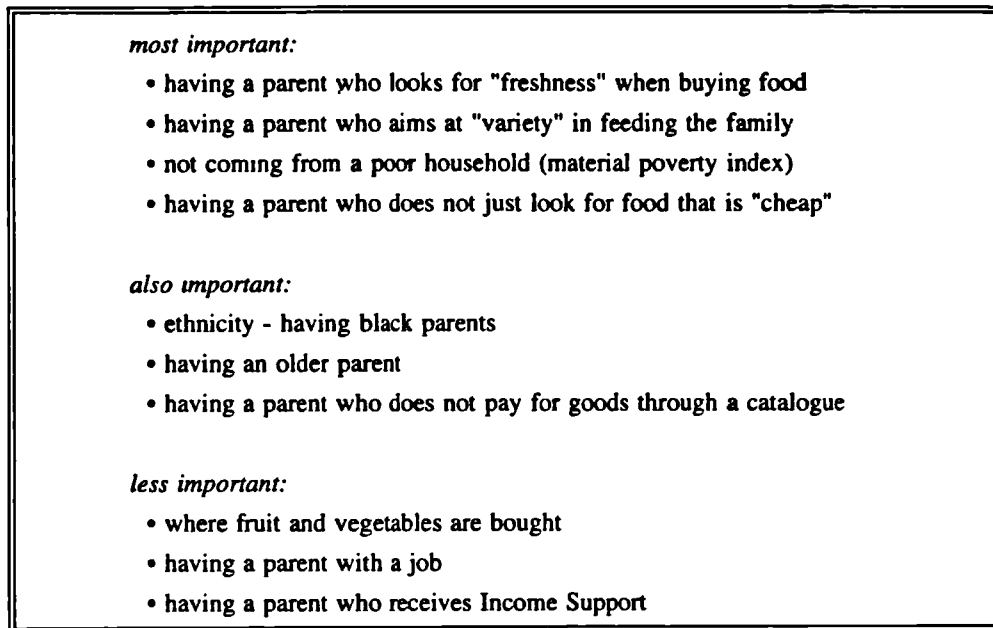
figure 5.5 factors associated with higher fruit and vegetable variety in lone parents' diets



for explanation of terms, see figure 5.3

Cooking and eating patterns were associated with differences in VFS, whereas they had not differentiated nutrient indicators. All the VFS were higher for parents and children where parents said they liked cooking, than for those who did not. Cooking from raw ingredients, using fresh foods, was associated with a more varied diet by every index than producing snack meals or using simple ingredients for cooked meals (e.g. opening jars or packets, or beans on toast). Families where the parent and their children ate their meals together had high VFS scores. By contrast, parents who regularly ate take-away foods had lower VFS for vegetables, as did their children, than those who ate them less often, and their children had lower overall food variety.

figure 5.6 factors associated with higher fruit and vegetable variety in children's diets

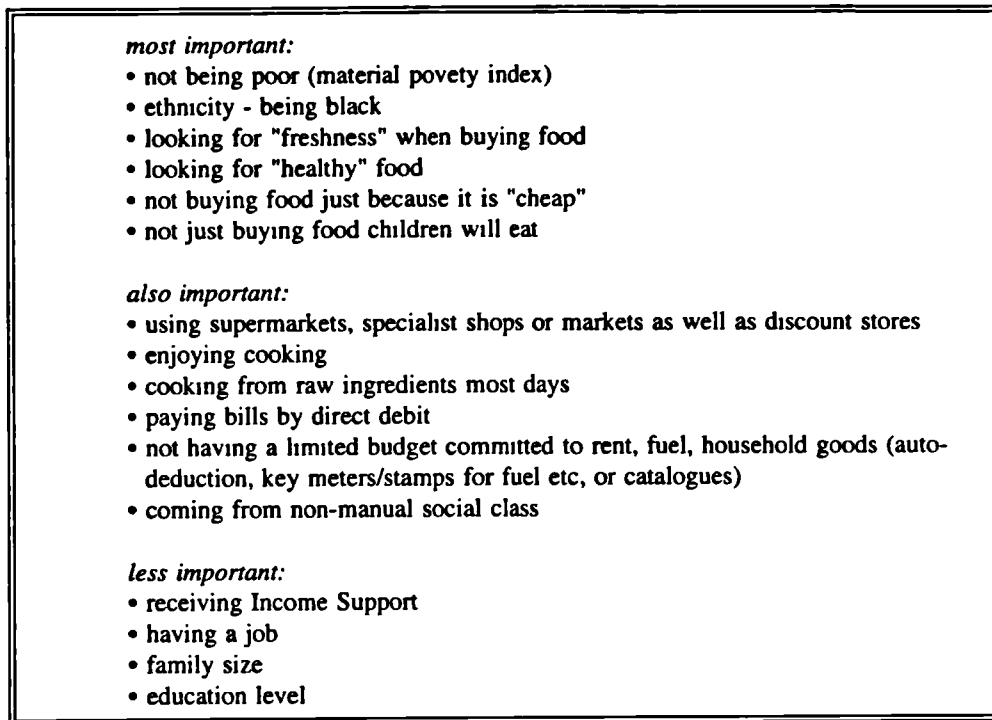


for explanation of terms see figure 5.3

Healthy dietary patterns

Healthy diet scores: The range of HDS obtained in the survey was from -131 to +709, with a mean score of +204, in parents; and from -225 to +476, with a mean score of +117, in children. Figures 5.7 and 5.8 summarize the most important factors associated with high HDS in parents and children respectively, using the same presentation format as for the VFS (see figure 5.3). The data on which the figures are based are given in appendix 5.

figure 5.7 factors associated with higher healthy diet scores for lone parents



for explanation of terms see figure 5.3

Three variables were strongly and independently associated with high positive HDS: not being poor, looking for food that was "fresh" rather than "cheap", and eating a typical Afro-Caribbean diet. There was no relationship with smoking.

Average HDS were higher for parents and children for each category of the material poverty index (parents: +265 +182 +114; children: +172 +77 +61). Other indicators of social class or poverty were only weakly associated with HDS. Low HDS were associated with having rent or fuel automatically deducted, paying fuel bills by keys or stamps, or repaying catalogue bills. Shopping exclusively in discount stores, the practice of the poorest, was strongly associated with low HDS. For instance, children of those who shopped in discount stores for meat and fish had a negative HDS (-4), whereas those who used supermarkets, markets or specialist shops for meat and fish had a score of +168. Parents exclusively using discount stores for their main shopping

had half the HDS of those using the bigger supermarkets; the difference in their children's scores was even more marked.

figure 5.8 factors associated with higher healthy diet scores for children

<i>most important:</i>
• not coming from a poor household (material poverty index)
• having a parent who looks for "freshness" when choosing food
• having a parent who aims at "variety" in feeding their family
• having a parent who regularly cooks from raw ingredients
• not having a parent who just buys what they think their children eat
<i>also important:</i>
• ethnicity - having black parents
• having a parent in social classes ABC1
• not coming from a household with a limited budget committed to rent, fuel, household goods (auto-deduction, key meters/stamps for fuel, or catalogues)
• having a parent who looks for "healthy" food when shopping
• having a parent who likes cooking
• having a parent who uses supermarkets, markets and specialist shops
<i>less important:</i>
• having a parent who receives Income Support
• having a parent who has a job
• parent's level of education
• where fruit and vegetables are bought

• for explanation of terms see figure 5.3

As with nutrients, respondents seemed able to make a difference to their own diets and to their children's, by their aims in shopping and feeding their family. Those who said they bought food that was "fresh", or "healthy" had much higher HDS (+299) than those who didn't mention those reasons (+150), as did their children. Even those in the lower categories of the poverty index who looked for "fresh" food, achieved HDS for their children of +117, against only +30 for children of poor parents who didn't mention "fresh" food. Parents aiming at a varied diet achieved twice the HDS for their children than those who didn't mention that motive. Those who said they bought what they themselves or their children liked, had lower HDS (133:243), as did their children (44:162). Looking for cheap food was less associated with lower HDS.

Those who said they liked cooking, those who cooked from raw ingredients during the week, and who ate with their children, had high HDS, as did their children. For

Nutrition in lone-parent households: nutritional results

instance, children's mean scores of those who cooked regularly was +135, compared with only +6 for those whose parents tended to open packets and cans, or served things "on toast". The poorest parents who cooked from raw ingredients achieved a mean score of +91 for their children; those who didn't, -54.

Black British, Caribbean or African parents and their children had higher HDS than white households; although the differences were not in themselves very large, the associations remained consistent and quite powerful.

Fruit and vegetable index:

The fruit-vegetable count obtained ranged from 1 to 27 (mean=2.0) in parents, and from 0 to 24 (mean=1.9) in children. The very low counts betoken those who mostly ate fruit or vegetables 2-3 times a month or less often. The high counts were from those who regularly ate a mixture of vegetables (eg, mushroom, tomato, peppers, onion), in stews, stir-fry or salads, and probably one or two pieces of fruit daily. All these people were included in the highest cut-off point of "5 and over". Only onions, apples, bananas or, to a lesser extent, tomatoes, were regularly reported as being eaten "most days", which seems plausible. Those in the highest category of the fruit and vegetable index had higher intakes of vitamin C, folate, zinc and NSP from the dietary survey than those in the lowest category (see appendix 2), which suggests that those who said during the FFQ they ate plenty of fruit and vegetables probably did so.

Parents eating at least five fruits or vegetables a day were more likely to be black Africans, black British or Caribbean. They were also more likely to come from non-manual classes, to have tertiary education qualifications, and not be in receipt of Income Support. The poorest by the poverty index were the least likely to eat more than five fruits or vegetables a day. Those who said they always looked for "fresh" food were much more likely to be eating more than five fruits or vegetables a day, particularly if they were not poor.

Nutrition in lone-parent households: nutritional results

Similar factors were associated with eating more than five portions a day in children, although the associations, except for looking for "fresh" food when shopping, were weaker. In addition, those who specifically said they tried to encourage their children to eat more fruit and vegetables seem to succeed: their children were more likely to eat more than five portions a day, whereas the children of those who didn't mention this aim were more likely to eat fewer than two. (Respondents answered the FFQ, on which the fruit and vegetable index is based, about half an hour before discussing their aims and beliefs about food and health, so their responses to the fruit and vegetable FFQ would not have been influenced by being asked about their practices)

There was no relationship between parental smoking, being a vegetarian, age or family size, and the fruit and vegetable consumption index, in either parents or their children.

Proportion of energy from fat and saturated fat:

Fat intakes in the poorest households were no higher than in the general population. Fat as % energy intakes is shown for female lone parents in table 5.11.

table 5: female lone parents: fat and saturated fat as % energy intakes

	% energy from fat (se)	%energy saturated fat (se)
Income Support (n=85)	39.3 (0.66) ns	13.9 (0.50) ns
no Income Support (n=41)	37.8 (1.02)	12.8 (0.52)
black Afric/Brit/Carib (n=29)	36.3 (1.12) **	10.2 (0.71) **
white Europeans (n=91)	39.8 (0.64) **	14.2 (0.42) **
all female parents (n=126)	38.8 (0.56)	13.5 (0.38)

** differences between values for black Afric/Brit/Carib and white Europeans significant $p < 0.001$

Those from Afro-Caribbean or black British households had lower % energy from fat or SFA than those from white, mainly because their energy intakes were higher (table 5.3). In addition, those who were white and didn't mention health as a dietary aim had higher % energy from fat than those who said they aimed at "health" (most of

Nutrition in lone-parent households: nutritional results

whom, when asked what specifically they did, said they grilled food). Younger women had higher % energy from saturated fat than older women. No other factors differentiated energy from fat as a proportion of energy intakes.

Summary:

In this chapter nutritional results from the lone parent survey have been summarized in terms of demographic and socio-economic variables, and the relationships with strategies for managing food and the household budget examined using quantitative analytical tools, have been presented. Severe constraints on money, ethnicity, and factors such as whether or not parents smoke or why they buy the food they do, were shown to be the principle variables differentiating adequate diets from less adequate, or reasonable dietary patterns from those less conducive to long term health and well-being. Those factors which had negative impact have been shown to have more effect on parents' diets than on children's.

Chapter 6 NUTRITION IN LONE-PARENT HOUSEHOLDS: FOOD CHOICE

In the previous chapter, the poorest parents were shown to be least likely to have adequate nutrient intakes, high variety frequency scores, or "healthy" dietary patterns. Nonetheless, it was also evident that those who were poor but said they sought "fresh" or "healthy" food had more varied, healthier dietary patterns than those who did not mention such aspirations, although those who were not poor did better still. The strength of these associations with stated intentions, which were somewhat unexpected, prompted two further lines of enquiry on aspects of food choice and its relationship to poverty. First, a sub-sample of interview tapes were re-analysed to investigate themes and constructs used by parents in discussing food and health, particularly in relation to living on state benefits; and secondly, cluster analysis techniques were applied to responses by the whole sample to the two questions about dietary aspirations, to investigate any patterns in the responses, and their socio-economic dimensions. Details of these analytical methods are given in appendix 2.

Food Choice: models of understanding

Food choice is a potential locus for debate between social scientists concerned with observing and interpreting people's food behaviour (purchase, preparation, allocation and consumption) and policy interventionists for whom "informed consumer choice" underpins much contemporary policy in nutrition and preventive health. Whether food choice is always and exclusively an aspect of individual "behaviour" is a moot point; nonetheless it is so located in the argument that the poor die younger than they might because they smoke too much, take too little exercise and eat the wrong things - that is, they "behave badly", or at least, inappropriately. Furthermore, public health intervention in food for low income groups by, say, cookery clubs or community cafes, to widen poor people's experience of different kinds of food and cooking, is often based on the implicit assumptions that poor people look primarily for food that is cheap, because they are minimizing cost and maximizing utility (or if they are not, they should be); and secondly, that they do not know what foods are best for health - in general or as promoted in "healthy eating" guidelines - poverty is in alliance with ignorance.

In fact, the food sociological^{literature} (and to a lesser extent the nutrition literature, often shows that firstly, poor people's food aspirations are no different from the general population's (see Dowler and Rushton, 1994); secondly, that their ability to purchase foods which are best value for money is usually high (e.g. MAFF, 1994a). Thirdly, poor people's knowledge of the role of food in maintaining good health and their familiarity with current "healthy eating guidelines" is no worse than that of the general population (Dobson *et al.*, 1994; Williams and Dowler, 1994). If poor people's nutrient intakes or dietary patterns are less appropriate for health than those of richer households, reasons must be sought which are beyond simple notions of "failure of knowledge" or "unwillingness to put knowledge into practice". In this thesis "food behaviour" is generally used to encompass not only what and why particular food commodities are bought and how they are prepared, but also wider issues of the kind of shops people choose to patronize, how people allocate money from a limited budget to food, and what kinds of priority poor people place on different kinds of food.

Reference has been made to the implicit base for much intervention in the food arena of the "KAP" model of behaviour: that "practice" follows from "attitude", which is governed primarily by "knowledge". Changing "knowledge", with some attention to practicality and "attitude", will lead to desirable change in "practice". Food choice is clearly not as simple as this model implies. The literature is large and to some extent polarised between biological and behavioural model construction (e.g. Shepherd, 1990; Johnston, 1995) which concent^{trate} on biological motivation, and inevitably focus on the individual and her/his attributes, while ignoring the role and effects of social groupings of household and society. By contrast, sociological or anthropological insights into "food choice" rationale describe contextualized behaviour, and resist breaking it down into discrete sets of linear decisions over obtaining and eating a given food commodity (e.g. Murcott, 1995; Beardsworth and Keil, 1993). Draper (1991) produced a fairly comprehensive literature review for her study on vegetarians' intakes and food choice rationale; she does not include economists' models (they seldom address vegetarianism in their theories of consumption behaviour), but could have included them under the "rational, utilitarian" label, price being the economist's measure of utility.

Draper rejects materialist or utilitarian approaches, whatever their derivation, for their *"limited ability to account for the diversity of human eating behaviour and food choice"* (Draper, 1991, p24). She adopts the more cultural and symbolic approach developed by Douglas (1982) and, with Wheeler (1992), argues that explanation of why people consume what they do, and the meaning they invest in that consumption, has to be grounded in social process, which makes the failure of the classic utility theory of consumption to account for the diversity of consumer behaviour in food understandable. In striking parallel with dialectical theories of behaviour and sociological "grounded theories" (Glaser and Strass, quoted in Stainton Rogers, 1991; Jones, 1985) Douglas and Isherwood interpret 'goods' (including food) as *"messages which convey information about the abstract concepts and values to which their user subscribes, as markers of cultural categories, and as a means of establishing relationships, in addition to being a source of physical satisfaction"* (Douglas and Isherwood, 1980, quoted in Draper, 1991, p25).

These ideas were applied in an elementary fashion to the material of the present study: the words people themselves used were reviewed, with the meanings and interpretations as they gave them, to try and make sense of the underlying categories and concepts (Jones, 1985). Clearly this is not an objective process; nevertheless, allowing people to "tell their story", and not necessarily coding their answers into pre- or post-constructed categories as in this survey, is part of coming to understand their "behaviour".

Thirty interview tapes, selected randomly to reflect the range of ethnicity, material circumstances and food aspirations in the sample, are summarized below using the terminology of the individuals concerned.

In-depth interviews

cooking and eating patterns:

Responses to questions about cooking seemed to fall into two, perhaps three categories. Many said immediately they very much enjoyed cooking, although several

added they would enjoy it more if they had the time or money to do it properly - often they were very tired. Cooking was something they had learnt at home from parents, often consciously as a skill, along with learning to budget and buy food; sometimes what they learned at home had been rudimentary and they had subsequently taught themselves a lot or learnt from a partner. A number of black parents said in addition that they had been to catering college to learn further skills, which some used professionally. Broadly speaking, these parents all said they cooked a variety of meals during weekdays, usually from raw ingredients, so making their own pies, quiches and stews, even though some had very limited facilities and space. Black parents nearly always said they cooked "soup" at the weekend, or that "Saturdays is when I *cook*" - in both instances meaning they prepared a large traditional dish containing many different ingredients, which would be expected to last several days, with or without further additions and cooking. Many parents, both black and white, said they had a roast meal for the whole family once a week, often on a Sunday. Many parents who liked cooking nonetheless also bought occasional or weekly take-aways, as part of the family's pattern of eating. Both white and black parents said they involved their children in choosing and sometimes in cooking what they were all to eat - they saw this as part of socialising their children into enjoying food. These same parents often mentioned their children's developing an understanding of and pleasure in food when asked about their aims in feeding their family.

By contrast, there were a number of parents who either said they didn't like cooking, or that they found it tedious or difficult when working full time or with no other appreciative adult to cook for. These people tended to say they had learned cooking at school; their weekly cooking was a mixture of simple dishes, often from frozen basics, or what Claire Calvert termed "assembly meals": putting a meal together by opening packets and jars. Several white parents said they bought and cooked exactly what individual children wanted to eat for each meal, because "otherwise they won't eat it, and I can't afford to have it wasted". They themselves would either eat what the children chose, or a simple alternative if their tastes were different. The same people said their aim in feeding the family was to keep them happy, so there were few complaints.

Finally, there were a few parents, mostly in their twenties, who were living with child/ren in their own parents' home; some had moved back after divorce; some had never left home (only a couple in the whole sample were teenagers). For some, trying to shop and cook for themselves and their child/ren in their parent's home was quite a strain; one or two were happy to leave all shopping and cooking to their own mothers, and they seemed to take little interest in food, although they could produce answers about food and health that accorded current common guidelines (low fat, little sugar, plenty of fibre and fruit).

Most black families ate traditional West African or Caribbean foods and dishes regularly. Several black parents commented that their children also liked typical "English" food, by which they meant burgers, pizzas, chips, mashed potato, lasagne, sausages and fish fingers; some were a bit dismissive of their children's tastes while others thought this a good thing because it was widening their children's experience. Younger black parents (say, under 25) also liked to eat these foods as well as their traditional foods.

Black families seemed to mention the family eating together and eating the same foods more often than white. In the latter, where the relationship between the parent and teenager(s) seemed difficult, food was obviously a focus for those difficulties. Sometimes the relationship between parent and an only teenage child seemed very close; this closeness was also expressed in food: the child was present for the interview, contributed ideas and amendments to the parent's accounts, and enjoyed eating with their parent. Some parents had quite strict rules about eating together, in meals and not snacking, that children should "learn to eat at least one vegetable", and be discouraged from sweet things; these were also mentioned as "aims". Many parents had more to say about their children's diets - what was appropriate and what not - than they did their own. Those who were quite poor and had youngish children would often say they tended to eat what the children left in the evenings, or "have a sandwich later"; many said they did not bother with lunch if they were at home on their own, and might simply "have a sandwich".

shopping:

Shopping patterns seemed extraordinarily complicated in most of the households, in that different commodities would be bought in several different places depending on what was needed, how the budget was going, what cost what where, and who would accompany whom. These things were easily articulated with enthusiasm. The exceptions were some of the poorest interviewed, who expressed little interest in food and shopping, and who simply went where shopping was cheapest and easiest, and some of the richest interviewed, who were quite interested in food and health but led busy lives, working full time, and used their car to go to their nearest usual large superstore, where they bought everything for a week or fortnight. Both exceptions seemed to regard shopping simply as one of the regular chores, to be done as quickly as possible.

Most parents however, described quite complex routines: they would buy some things in KwikSave or Iceland because X was a bit cheaper, but would buy others in Safeways, Tesco's or Sainsbury's because there was a wider choice of goods - "I can't get all the bits I want in KwikSave". Many regularly shopped around for price and quality for their main goods; there was often comment at this and other stages of the interview about the merits of "own goods" versus "brand names": the balance of taste and price was not always predictable (middle class people did not necessarily eat "own brands" and working class people "brand names"). Most used a market, street stall or West Indian shop for fruit and vegetables because they were cheaper or fresher or both. Many bought meat and fish in specialist shops where they knew the quality was reliable, and were themselves known so would be guaranteed good service; most black parents used markets for meat and fish as well. Many black parents used bulk buying for tinned goods and meat (and a freezer). A number of parents expressed regret at the way their budget limited their purchases: "I'd love to go to Sainsbury's with £100 and buy food for my boys"; they could not buy fresh fish, or as much fruit as they would like. Several white parents mentioned they seldom bulk bought fruit, say, at markets, because their (teenage) children would eat it immediately. They bought food in small quantities and shopped often as a way of controlling consumption.

food purchase choices and aims:

Two open-ended questions were asked: "When you are buying food, what are you looking for?" and "What are your main aims in feeding your family?". The questions were deliberately unstructured; people could and did answer in whatever way they chose. In addition to commodity characteristics, a number mentioned that they planned a menu for the week, or worked out exactly what they needed to maintain appropriate food stocks in the house, so what they were looking for also had to conform to this list and be within a strict budget. This practice was not described in a negative way; it was seen as an unfortunate necessity which was nonetheless an aspect of skill in managing the household and the budget. Did people otherwise answer in terms of their underlying principles, rather than immediate promptings (one might expect the poorest to answer "price" or "money" rather than anything else)? Often people answered in very specific terms; they could articulate what they wanted quite easily, and would then qualify that by reference to money and time as constraints on what they tried to do, rather than always giving those as governing principles.

There were very few ethnic differences in the answers. The following attributes were mentioned in answering "when you are buying food, what are you looking for?":

"fresh food/freshness" The word "fresh" seemed to have several meanings, often as an absence of undesirable negative, and which were not always mutually exclusive.

"not frozen": Many people mentioned preferring fresh to frozen or tinned foods during the FFQ, and reiterated "freshness, of course" when asked later "what do you look for?". It was not that people said they disliked frozen foods because of potential nutrient losses (which are in fact much less likely in frozen than other processed foods; some did mention nutrient losses in canning) but people simply asserted they preferred to eat fresh foods, or to eat dishes or food they had frozen themselves. Against this, a number said they preferred to buy some foods frozen, such as vegetables, because there was less waste through storage and preparation losses, and because they could control portions consistently. Some said their children preferred particular frozen

Food choice in poverty

goods (pizzas, burgers, fish fingers, peas), but they still mentioned "freshness" as a generally desirable quality in foods.

"not stale": This phrase cropped up with reference to vegetables, fruit, meat and fish: foods should be new rather than old, not having hung around in the shop/on the stall, not yellowed (veg) or greyish (meat) but bright and well coloured. Sometimes the decline in nutrient content with time was mentioned; the risk of disease from meat or fish being "bad" was hinted at but seldom made explicit. Some said they always looked for what was "fresh" just because so many of the foods they bought were perishable. The majority of the total sample and all the thirty said they always looked at the "sell-by" date on packaged products (though a number also said they bought so few packaged goods beyond milk and cereals it was hardly relevant). Those who used "fresh" in this way did not usually use it in opposition to "frozen".

"looks good/nice": This meaning usually referred to the pleasure of eating the food and its general quality. It had no connection with "health".

"health": This meaning was usually ascribed to foods which contributed to health (fruits, vegetables) and was a specific attribution of quality. It was not applied to packeted goods (I think particularly not packet or convenience jar sauces or soups, which were perceived as not containing much "goodness").

"natural": This meaning (commonly encountered in Draper's vegetarian study) was seldom encountered in the thirty interviews but did occur in the total sample, only 4.5% of whom were vegetarians. "Natural" was often combined with "pure", and seemed to mean food that had not been tampered with or processed.

"value for money" People often mentioned "price" but would qualify it as saying they didn't just buy "cheap" food: if you did that you just got "rubbish". Value for money was a matter of balancing quality and price: even on limited money parents would say they "wouldn't just buy the cheapest; I try to look for what is fresh and

nice, even though money has to come into it".

"cheap" Sometimes people said this immediately, with no qualification as to quality. It was because they were looking for "cheap" food that they shopped where they did: they bought food for as little money as possible. They always bought the cheapest alternative of what they decided to buy: if they bought mince, they bought the cheapest mince they could find; if they bought fruit, they always limited their choice of product to the cheapest fruit, and whatever they bought, they bought the cheapest version. There was mostly no relationship between the food aspiration answers and people's economic circumstances; "cheap" was the exception: people who said it had lower incomes than those who did not¹.

"what I usually buy" Sometimes this explanation was part of going out with a list and/or planned menus in mind. People bought the same things each week because they knew their children would eat them, or that they could produce meals within their budget. Sometimes the term was used to mean the family did not experiment with new foods or dishes in case they were not liked, and the food thereby wasted. Sometimes the phrase was used after words such as "fresh" or "healthy", to mean that the family always ate these kinds of foods: there was no special effort required; they always ate "healthily".

"what I like/what the children will eat" Usually these terms meant simply that individual tastes were satisfied, with little experimentation. Occasionally it was also used in conjunction with "healthy, fresh food", to indicate people really like those things - they didn't have to make a special effort to eat "healthily". Some also answered that they looked for things that were "tasty" or "caught their fancy": food that would make their diet interesting and enjoyable.

¹Their mean weekly household income *corrected for household size and composition* was £106 as against £149 ($p=0.004$) for those who didn't mention cheapness as a reason for buying food.

Food choice in poverty

"healthy" This word was also used in a number of ways, though less often than "freshness". Sometimes it meant actual commodities associated with health, such as beans, liver, or fruit. Sometimes it was a general idea of quality or "goodness"; sometimes a reflection of a general interest in health, with food as a part, albeit important.

"variety" This word meant "buying different kinds of foods" - being able to buy different sorts of vegetables and fruits, or meat or fish; not having a boring and monotonous diet; being able to prepare different sorts of dishes.

"balance" Sometimes this word referred to nutrient balance: obtaining protein, energy, vitamins, from food. Sometimes it was qualified as choosing foods that "balanced one another out": if you ate food that was fatty, you needed vitamins to even things up.

"quality" This word was used in explaining "value for money"; it was used on its own much less often. It was qualified as "being fresh and nice", "full of goodness", "I have to be satisfied as to the condition of it - good quality"; sometimes "food that tastes good".

When parents explained their aims in feeding their family they often mentioned similar words: varied diet, balance, healthy food, wholesome food. They would refer to the desire to please the family; to avoid conflict over foods; to make sure they enjoyed their food; that they could buy "good food that tastes good". "If you eat the food you want it's what your body wants." A number mentioned training or enabling their children to appreciate good food - how to buy, prepare and cook it, to eat in regular mealtimes, to choose good things to eat.

People also said they wanted their children to grow well and be healthy and strong. People again talked about trying to ensure everyone had a balanced, good, diet. A few parents expressed some (unsolicited) anxiety about whether they were achieving their

aims, particularly whether they were feeding their children the right foods to be healthy. This uncertainty seemed more to do with whether they themselves were doing the right things than with whether or not the children took any notice².

Several parents said their aim was to make sure the family had enough to eat when they were hungry; that they should be able to give their children a meal every day; that they should be able to feed the family enough as cheaply as possible. One older mother admitted as well that she simply "lived from day to day": she had been poor for a long time following divorce, and had a difficult relationship with a teenage son partly expressed through food. Apart from her married daughter, whom she saw regularly, she seemed fairly isolated; she lived on a busy main road with few neighbours.

When asked their views about the relationship between food and health (with questions framed as above) most people answered immediately: either that there was definitely a connection which they were happy to elaborate, or that they thought it all nonsense or irrelevant, and that they "never took any notice of it". Those who endorsed the relationship mostly seemed to know the general current messages: almost everyone mentioned eating less fat, and when asked about practice, described cutting fat off meat, boiling mince first and straining it through paper to remove the fat, using less oil or butter, and (almost universal) grilling food. Occasionally people mentioned using low-fat spreads (though from the food frequency and logbook it was clear more did in practice; possibly people saw no need to mention it again). (None mentioned omitting crisps, snacks or biscuits.) Almost everyone mentioned eating more fruit, vegetables and salads, and said they tried to get their children to do so as much as their budget allowed. Some referred to the need to eat more fibre, which they mostly saw as

²It might be argued that talking to a nutritionist about food is bound to generate just such anxieties. While that explanation may be true, it was not the whole story: firstly, only a few parents said it; secondly, the anxieties were not strongly expressed, being almost offered in passing, and certainly did not invite comment from the field workers; thirdly, they were mentioned during the second half of a two-three hour second or even third interview, when respondents might have realized no advice or comment would be offered. Finally, these two questions about food aspirations and feeding aims had followed a long discussion about meal patterns and shopping which most people had seemed to enjoy, and the words "health" and "nutrition" had not been used by the field workers.

Food choice in poverty

coming from brown bread, vegetables and (a few) baked beans. Many mentioned trying to get their children to eat fewer crisps and sweets, to cut down sugar and salt, to limit fizzy drink intakes. Some mentioned eating more fish, especially more oily fish; some cut out red meat. A few said they didn't use salt in cooking and that their children were used to the taste.

There were some ideas which probably stem from school days a decade or so ago: an emphasis on children eating protein (which was meat), particularly boys. Some knew fruit and vegetables were "good for you" but could not explain why. Some young mothers saw fruit yoghurts as a good way of getting their children to eat fruit, and one was cross about a TV doctor who had said yoghurts were sources of sugar.

People were asked about food labels: what they used, and what they thought about the information. The majority used the "sell-by" date, some the ingredient list, especially for unfamiliar foods, but few took much notice of nutritional labels; those who did looked only at calories or fat content. The ingredient lists was used to check contents, whether they would disagree with a family member, and whether the product contained what it claimed to. There was almost universal mistrust (and misunderstanding) of additives and "e" numbers: many said they wouldn't buy foods containing them, there was much talk of hyperactivity; a number of mothers said their teenage children would tell them not to buy a particular product or brand that contained certain additives.

When asked what they thought about labels, people were divided between those who never took any notice of them (they were not interested, or had toddlers with them shopping so no time to look, or they couldn't read them without glasses); those who thought it very good the information was there, although more thought the information potentially useful than actually used it; and those who were deeply suspicious of the reliability of the information given, especially on what they called "convenience foods" (by which they seemed to mean frozen/ cook-chill ready made dishes), or of descriptions such as "free range" or "organic". The nutrition labels were almost

universally thought useless: people literally could make no sense of them, and those who knew some nutrition (for instance, nurses) wondered why % requirements wasn't given, or nutrients as a proportion of weight. People would say "I don't understand all the poly-whatits", or "what's a complex carbohydrate?".

When asked about where their ideas on food and health came from most people were unable to articulate their sources and thinking. Even those who had quite sophisticated "healthy diet" knowledge, or who were very positive about cooking and shopping for food, became tongue tied when trying to explain how they knew what they did, and what they thought about current sources of information and advice about food. What was also interesting was that few answered these questions solely in relation to heart disease or cancer and food (it was never suggested they should: the question was simply "a lot of people think the food you eat is important for your health. Others think it's a load of nonsense, or all exaggerated. What do you think?"). People talked about general hygiene in cooking and preparing food; about BSE, salmonella and listeria; about heart disease; about children's teeth; about hyperactivity; about being happy and not depressed; about general well-being. Lay concepts of "health" and the relationship with food are complex, which is presumably why many found articulating the basis for their views so difficult.

Several had learnt about food and health in their professional training: nursing, catering, child care. Some referred back to schooldays, where they had learnt about food groups and nutrients. In terms of everyday sources of information, television was often mentioned: programmes about food, or with items about food; news; advertisements. Few said they purposely watched programmes about food, though if they came on, they would watch them if they were interesting and practical; some never had time to watch television. Many also mentioned magazines, leaflets from supermarkets or doctors, and newspapers. Some had had specific advice from health visitors, doctors or a clinic; this advice was trusted and deferred to. Several had a sister with strong views and was "always reading books and magazines about health and food; she'll tell me we ought to eat this, or stop eating so much of that"; sibling

Food choice in poverty

advice was much respected and followed. Otherwise people were uncertain how they knew what they did: "I just pick it up by word of mouth"; "I'm too busy to pay much attention but if something interests me, I'll listen"; "I don't know, I just seem to absorb it unconsciously".

People were divided in their opinion about the value of current advice and information. Many were suspicious of motives: a number thought people were simply trying to sell things. At first, this seemed a confusion between advertisements per se, and leaflets or TV/magazine guidance based on "expert" advice. On reflection, it seemed a less unreasonable conflation: much food advertising does make use of current healthy eating advice, both for products and for food stores, and parents' guarded acceptance is a realistic response to overlap of official and commercial statements. Others were much more positive about present information, thought it good, and wanted more of it, particularly geared to the needs of those on low incomes. However, the most commonly used phrases were "I make up my own mind about things", "I think it depends on the individual", "I listen when it makes sense". It was noticeable that many of those who had expressed positive food aspirations would be somewhat dismissive of "official" healthy eating advice and denied taking much notice of it, yet had clearly absorbed current ideas from somewhere because they could enunciate them and put them into practice.

Those living on limited means often commented on how unrealistic published healthy eating advice was:

"you're looking at what expectations are of you to eat ... the leaflet was beautifully done, it had all these wonderful colours of vegetables and meat, but [it wasn't presented] according to your budget ... these leaflets look at the consumer as an affluent consumer, it's presented only for certain groups of people." (lone mother, 30's, with two dependent teenagers)

This mother, an enthusiastic cook who had described cooking as *"like a celebration for me ... the central part of the home life is food"* described the problem faced by many lone parents in her position (working voluntarily and claiming Income Support) of needing to *"fill people up in an interesting way"* because *"children demand that, they*

demand to be fed," and often with the same foods as their friends. She was determined they would continue to enjoy food, and to eat as varied and nutritionally sound a diet as she could provide.

Cluster analysis of food choice responses

A number of the ideas expressed above seemed to overlap with one another, and to some extent the impression from listening to the tapes was of people who either talked about the pleasures of cooking and eating fresh, healthy food, or who described the drudgery of eating cheap food, cheaply prepared as simply as possible. Attempts were made to substantiate these impressions through cluster analysis of answers from the whole sample, to investigate patterns in the responses to the two open-ended questions, and to see if groups of parents could be identified on the basis of their responses.

Details of the methods are given in appendix 2. Briefly, clustering techniques were applied to the binary variables derived from the responses, to each question separately and to the two combined. These response variables were the unit of analysis to look for patterns, employing both absolute values of the correlation coefficients (which uses the strength of the relationship between the variables) and signed values (which indicates direction). Some analyses were repeated using factor analysis. Clustering techniques were then applied to lone parents as cases to investigate the presence of distinguishable groups.

The best solutions produced using the absolute values of the correlation coefficients are shown in figure 6.1; the first two columns are clusters based on answers to the "food choice" question, the second two are based on answers to "food aims". Figure 6.2 shows solutions produced using the signed values of the correlation coefficients.

figure 6.1 cluster solutions for food choice and food aim variables, using absolute values of the correlation coefficients
(average linkage between groups method; sign of correlation shown in brackets)

3 clusters food choice	6 clusters food choice	4 clusters food aims	3 clusters food aims
best I can afford (-) special offers	best I can afford	future health/growth kids good diet ()	future health/growth kids good diet (-)
freshness (-) what kids will eat what I like to eat quality cheapness/price (-) value for money what I usually buy (-)	special offers	learn to enjoy food provide variety	learn to enjoy food provide variety
what I fancy (-) healthy food	freshness (-) what kids will eat what I like to eat	provide balanced diet	provide balanced diet keep family happy (-) provide healthy food not be hungry (-)
	quality cheapness/price (-) value for money what I usually buy (-)	keep family happy (-) provide healthy food not to be hungry (-)	
	what I fancy		
	healthy food		

Both sets of solutions suggest a reasonably consistent patterning of responses to the "food choice" question. The correlation matrices on which these clusters were based are given in appendix 6. None of the correlation coefficient in the matrices was large, but several were significant at the 0.01 and 0.001 levels. When based on correlation taking sign into account, the best clustering solutions had four or five groups, with the most commonly given answers grouped into three categories: "looking for freshness/quality/value for money"; "looking for cheapness" and satisfying family desires. (Very few offered "the best I can afford" or "something I fancy" as answers.) The absolute values of the correlation coefficients indicate the strength of relationships as well as which answers were *not* offered together. Clustering solutions using absolute values were slightly less satisfactory because four variables, in fact offered by few respondents, each remained in a separate group, so the best solution needed six

clusters. However, the variables which clustered in the two main groups suggest that those who said "freshness" was important seldom also mentioned satisfying family likes and dislikes as a priority; likewise those who said they regularly looked for cheap food seldom mentioned "quality" or "value for money" as well. Whichever method was used "what kids will eat" and "what I like" were always grouped quite early in the process, as were "freshness" and "value-for-money", which suggests these answers reflected consistent and separable philosophies.

figure 6.2: cluster solutions for food choice and food aim variables, using signed values of the correlation coefficients
(average linkage between groups method)

<i>5 clusters food choice</i>	<i>4 clusters food choice</i>	<i>4 clusters food aims</i>	<i>3 clusters food aims</i>
freshness quality value for money	freshness quality value for money	learn to enjoy food provide variety provide balanced diet kids good diet	learn to enjoy food provide variety provide balanced diet kids good diet satisfy family
cheapness/price	cheapness/price	satisfy family	provide healthy food
what I fancy special offers what I usually buy	what I fancy special offers what I usually buy	provide healthy food	future health/growth not to be hungry
what kids will eat what I like to eat	what kids will eat what I like to eat best I can afford healthy food	future health/growth not to be hungry	
best I can afford healthy food			

The food aim clustering produced fewer clear clusters, in part because it was based on only eight variables. Whichever method was used, provision of a "balanced", "varied" diet that children learned to appreciate and enjoy was consistently a separate set from concerns to ensure the family did not go hungry, or had enough food, or survived well in the future. Clustering based on the absolute values supported this separation: those who expressed their aims in terms of health/balance/variety seldom mentioned avoiding hunger.

When the variables based on responses to both questions were clustered together (19 variables), a five cluster solution was the most satisfactory and is shown in figure 6.3. (Under the four group solution the first two groups shown join. The last groups to join together are the "family desires" and "quality" groups.)

figure 6.3 five cluster solution to "food choice" and "food aim" answers combined:

best I can afford; learn to enjoy food; provide variety

provide balanced diet; quality; freshness; value-for-money; kids good diet; provide healthy food; healthy food

special offers; what I usually buy; what kids will eat; what I like to eat; satisfy family

cheapness/price; not to be hungry

future health/growth; what I fancy

These groupings are also plausible and reinforce the observations above about which variables join together first, and which are correlated in opposite directions. Cluster analysis of the "food choice/food aims" variables supports the idea that people do have a reasonably consistent philosophy towards choosing food, combining immediate qualities, such as cost and quality from appearance, with more long-term aims, such as satisfying family desires or maintaining future physical well-being.

The same variables were analysed using factor analysis; five distinct groupings of variables were obtained: *i*: what kids eat/I like/(-)freshness; *ii*: (-)cheap/value-for-money/quality; *iii*: usually buy; *iv*: what I fancy/healthy food; *v*: best I can afford/special offers. This pattern is very similar to the six cluster solution using the absolute values of the coefficients, shown in figure 6.1. As the SPSS Manual says "factor analysis and cluster analysis need not always arrive at the same variable groupings, but it is comforting when they do" (Norusis, 1990 p169.)

The next stage was to see whether parents could be identified as holding one "set" of views rather than another, and if so, whether this "set" of views could account more powerfully than single variables for the differences in variety scores and nutrient intakes described earlier. It seemed a rather unlikely prospect to find people fitting neatly into one category or another; more plausible is a spectrum of views, with some at one or other end and most spread along the middle. Nonetheless "parents" were clustered as cases and resultant groups were interpreted or identified in terms of the variables by assigning group membership to parents, and using discriminant analysis.

Clustering parents on the basis of their food choice variables resolved essentially into five or possibly six groups, with clear identification of variables for three.

Discriminant analysis suggested key variables associated with each group as shown in figure 6.4:

figure 6.4 five cluster solution to lone parents' views on food choice

group 1 (65 members)	- freshness; quality; value for money; very -ve on cheapness/price
group 2 (41 members)	- cheapness/price
group 3 (29 members)	- cheapness/price; usually buy; what I like/ kids will eat
group 4 (29 members)	- what I usually buy
group 5 (25 members)	- what I like/kids will eat

(Three of the four discriminant functions retained large eigenvalues, had high canonical correlation coefficients and small Wilks' lamda; all were significant. 91% of all grouped cases were correctly classified. Over 90% of groups 1, 2 and 4 were correctly classified, 83% and 88% were correctly classified for groups 3 and 5. Mapping confirmed that five groups could reasonably be distinguished, with more separation for groups 1, 2 and 4.)

The group membership identities shown in figure 6.4 were tested against the Variety Frequency Scores, nutrients and key independent variables using ANOVA (regression approach), simple correlation and chi-squared tests of association. There were

significant differences in VFS (adult and child total variety; adult and child fruit variety and vegetable variety were tested) across the cluster groups ($p < 0.0005$). The pattern of results was consistent across the six VFS tested: those in the first cluster group of 6.4 (freshness/quality) were always much higher than any other group; the difference was probably the main contribution to the statistical significance. Those in the fourth group (look for what I usually buy) consistently had the lowest VFS scores, although sometimes the actual values were not much lower than the fifth or third groups'. The second group (cheapness/price) usually had intermediate values. A similar pattern was observed for parents' nutrient adequacy although few of the relationships were strongly significant: those in the first group had the highest levels of adequacy (and the lowest % energy from fat). There was no relationship with children's nutrient adequacy. These findings confirm that these distinguishable approaches to food choice had led to significantly different outcomes in terms of what foods people said they actually bought or ate, and how often.

Testing the group membership identities against the independent variables showed that occupational social class did not account for group membership, which was only weakly associated with income (those in the first group had the highest; those in the second, third and fifth the lowest $p < 0.04$). The two main variables which were associated with cluster group membership were ethnicity and poverty. Black parents were more likely to be in group 1 (freshness/quality) or groups 2 or 3 (cheapness/price and mixture) than in groups 4 or 5 (I look for what I usually buy/what the kids will eat) ($p = 0.0008$) whose members were mostly white. Those in the lowest category of the poverty index were more likely to be in group 5 and less likely to be in group 1 (freshness/quality) than parents who were not in either poverty category ($p = 0.003$). Parents in groups 2 or 5 were more likely to be in receipt of Income Support than not ($p = 0.002$). Those in groups 1 or 4 were much less likely to be using stamps and catalogues to pay household bills ($p = 0.008$). Those in group 1 (freshness/quality) were less likely to be smokers than those in group 2 (cheapness/price), but the association between smoking and group membership was otherwise not strong ($p = 0.02$).

Clustering parents on the basis of their "food aim" variables resolved most satisfactorily into four groups, shown in figure 6.5, although only three could be clearly characterized. The fourth joined group one in the three group solution. The group concerned with "not being hungry" was consistently quite distinct from the others.

figure 6.6 Four cluster solution to lone parents' expressed food aims

group 1 (49 members)	-	children to have good diet
<hr/>		
group 2 (41 members)	-	to feed the family healthily
<hr/>		
group 3 (42 members)	-	to avoid hunger/have enough to eat
<hr/>		
group 4 (51 members)	-	(no clear identity) variety/enjoyment/please family

(The first function identified in discriminant analysis was dominated by "not being hungry"; this function had the largest eigenvalue and contributed 86 % of the variance. However, the canonical correlation was high and Wilks' lamda was small, for all three functions, and all three were significant. 93% of cases were correctly classified; 100% of groups 2 and 3 were correctly classified, 92% of group 1 and 82% of group 4. Mapping showed groups 1, 2 and 4 to be distinguishable but close to one another; group 3 was clearly separate and discrete.)

When parents' food aim group membership was examined with the Variety Frequency Scores there were no significant relationships except for a weak association with adult Fruit VFS: those in groups 3 (not being hungry) and 4 (variety/enjoyment) had lower fruit VFS than those in groups 1 and 2 (children to have a good diet and to feed the family healthily) ($p=0.04$). Those in group 2 (feed the family healthily) had a lower % energy from fat ($p<0.005$), and parents' nutrient adequacy was higher for folate, NSP ($p<0.02$; similar, non-significant trend for other nutrients), than those in the other groups. Few of the independent variables showed any relationship with the food aims cluster group membership. There was a weak association between group membership and occupational social class, in that the majority of group three (not being hungry) were in the manual group ($p=0.04$). There was a weak association with the poverty

Food choice in poverty

index: those in groups one (children to have a good diet) or two (to feed the family healthily) were slightly more likely not to be in either poverty category, and those in group three (not being hungry) were more likely to be poor ($p=0.02$).

These findings indicate that firstly, although those who have a long term experience of poverty are more likely to describe their food aims as ensuring their family has enough to eat, and less likely to refer to more general aims of health and happiness, not all parents in these circumstances articulated aims in these terms. Secondly, people's longer term aims in feeding their family seem to have little impact on quantifiable outcomes of food patterns and choice.

There was no convincing evidence from the interviews that health or nutrition education campaigns had affected dietary aspirations: it was not obvious why some people held one set of attitudes and some another: looking for "fresh" food rather than "what the children will eat", finding time and money to shop around. What was clear was that many wanted quality in relation to food, even though their economic circumstances were limited because they claimed Income Support. Poor people do not necessarily look for food that is just cheap; they may hold aspirations in common with those in the population who are not poor.

Summary:

This chapter has examined the concepts, beliefs and some of the practices lone parents exhibit in relation to food choice, in an attempt to understand the messages thereby conveyed about values and relationships (see Douglas and Isherwood, 1980 and above). People do seem to be distinguishable in terms of how they think and act towards food: shopping, cooking and eating; those differences are further discernible in their outcomes on dietary patterns and, to some extent, nutrients.

Chapter 7 DISCUSSION, POLICY IMPLICATIONS AND CONCLUSIONS

The first main objective of this thesis (chapter 1) was to investigate nutritional conditions in low income households in contemporary Britain, using empirical evidence from a survey of lone parent families. In the preceding two chapters, associations between nutrition outcome indicators and a wide range of independent variables were presented, employing both quantitative and qualitative analyses. These analyses were based on the model of food and nutrition security in figure 1.1, reproduced in expanded form as figure 7.1 below. The majority of factors listed were investigated in the survey; the main conclusions are:

- Nutritional deprivation exists in lone-parent households primarily in association with poverty: poor material circumstances, particularly when combined with severe constraints on disposable income through repayment of debt arrears, were the main independent factors characterizing nutrition conditions. Though no empirical evidence was obtained in households that were not headed by a lone parent, there seems no intrinsic reason why conditions should be any different in other households who live in poverty for long periods: the constraints faced and the nutritional consequences would be similar.
- The poorest, most financially stressed lone parents adopted a number of budgeting strategies (general and in relation to food) to manage their limited resources, many of which had negative consequences for food and nutritional status, particularly for the parent. However for the most part, where people shopped and how they managed their food stocks seemed to make little difference to nutritional outcomes.
- Whether or not they claimed state benefits, parents who aimed to shop for and cook "healthy", "fresh" food achieved better diets for themselves and their children. Two or three approaches to food could be distinguished on the basis of expressed attitudes to shopping, cooking and eating, but the relationship

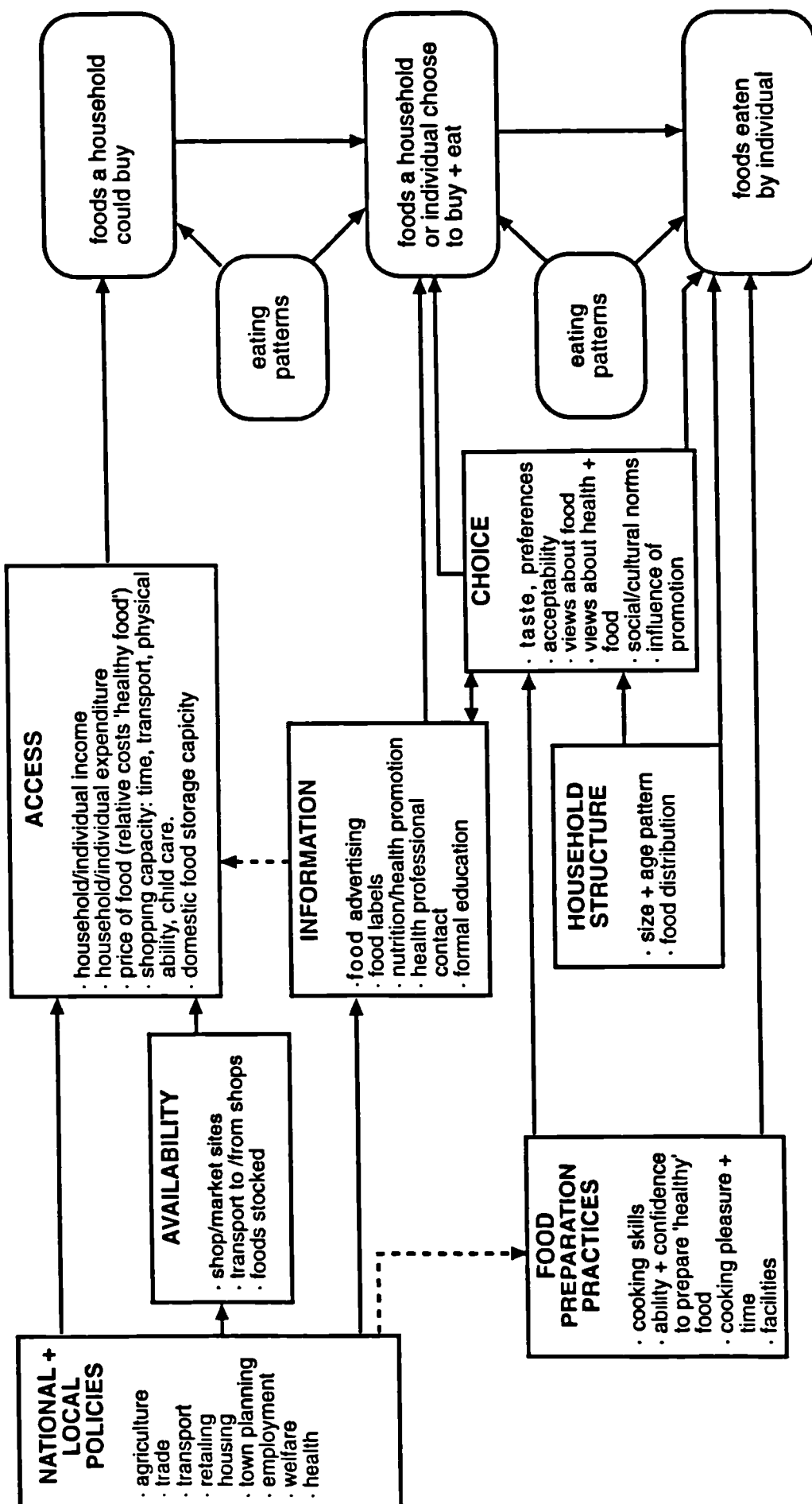
Discussion, policy implications and conclusions

between these and health beliefs was less clearly articulated. The approach to food that parents adopted was to some extent independent of their socio-economic circumstances, although the nutritional outcomes were clearly associated with material circumstances: those who were poorest always fared worse than those who were not poor.

- Ethnicity was also an important factor: those who shopped for and cooked food that was typical of black British, west African or Caribbean households by and large did better nutritionally than those eating food typical of white households, irrespective of occupationally based social class.
- Parents who smoked had worse diets than those who did not smoke, but the negative associations between smoking and diet were more marked in the poorest households. The diets of smokers' children were hardly affected.
- The effects of poverty were seen more in parents' diets than their children's.

Thus, issues to do with *access* proved more important than any others. Availability was not considered directly in this survey (shop siting, range of foodstuffs) although there are indirect indications that it also contributes to nutritional conditions in poor households. Some issues to do with *choice and food preparation* were also important; aspects of information seemed to have little or negligible effects. The conclusions are elaborated below. The implications for policy towards low income households, including lone-parent families, are discussed in the final section.

figure 7.1 food access : the policy arena



Discussion: poverty

Comparisons could be made within the category "lone-parent household" because not all the households in the survey were poor. Income itself was not the most powerful differentiating variable: it was the combination of circumstances which was most important. The lowest nutrient intakes and variety scores, those most likely to have nutrient intakes below the LRNI, or those least likely to be eating five daily fruits or vegetables, were parents in the lowest *material poverty index* category: that is, parents who had lived for more than a year in local authority or privately rented housing, who were unemployed, had had no holiday, and had fixed, regular deductions from benefits or used key meters. This finding was largely true whether or not parents smoked, and independent of ethnicity.

Using a key meter was not always entirely by choice: although it was seen as preferable to having gas or electricity cut off, keys users were often paying a higher rate than regular users because they were paying back arrears. Those who said their fuel costs were deducted automatically from their benefit were almost certainly paying off arrears as well as current charges; likewise those who said their "rent" was deducted automatically would have been paying arrears (it was never clear how much was actual housing arrears as opposed to water or community charge; current rent was usually covered by housing benefit¹). In other words, a limited income from benefits, was being stretched further to pay back debts, a circumstance that is known to cause severe hardship (NACAB, 1993). This seems logical: benefit levels are supposed to be sufficient only for day-to-day expenses; if money is being taken off regularly, some expenditure has to be cut, and there is often little option for claimants other than to cut expenditure on food.

¹Some applicants for housing benefit are awarded insufficient to cover what they actually have to pay, and might thereby get into rental debt. This shortfall can occur for several reasons, including living in private rented accommodation whose rent is considered too high by those assessing housing benefit entitlement, or having deductions from entitlement made for non-dependents aged over 25 years who live at home, on the assumption that they contribute to rent (R. Cohen, personal communication). It is not clear whether any households in the sample were in these circumstances.

Discussion, policy implications and conclusions

These circumstances are not uncommon: in 1993, over 3.7 million claimants had been in receipt of IS for more than a year, of whom 750,000 were lone parents; more than 2.7 million had been claiming it for more than two years, of whom 350,000 were lone parents (DSS, 1995). In 1993, nearly one in five IS claimants (just under one million people) had deductions made from their benefits; over a third had more than one deduction made, with an average amount of £16 per week (the figures were not broken down by recipient type) (NACAB, 1993). However, recent research on direct payments found that almost half the benefit deductions being made between 1991 and 1993 were from lone parents' benefit payments (Marvion *et al.*, 1995).

In the survey 20% of the sample had money deducted from benefit or used key meters; they often described themselves as "robbing Peter to pay Paul": making ends meet was a constant struggle, and they regularly ran out of money for food. They were more likely to have to borrow money than those without key meters or rent deduction; they were also more likely to be under 35, and to smoke. In fact, older mothers consistently had better diets, as did their children, than those who were younger. For some indicators, there was an improvement with each decade in age from under 25 to over 45. This may well be because of poverty: lone mothers under 35 years tended to be poorer than older mothers, were more likely to have rent auto-deduction and key meters, and they were very much less likely to be in jobs.

Discussion: strategies for managing a tight budget

The people interviewed were to some extent those who were arguably coping with poverty: their debts were not so large that bailiffs had removed possessions, nor had their children been taken into care - they were intact, surviving families. (Of those who refused on the doorstep to take part several said they had too many problems to take on anything else.) People living on limited incomes develop many ways of coping with their circumstances to keep their family together (Cohen *et al.*, 1992; Graham, 1993; Dobson *et al.*, 1994; Kempson *et al.*, 1994) and the low income families in this survey were no exception.

Cash budgeting strategies: Many of the parents interviewed adopted strategies for controlling expenditure to ensure that bills were paid. As described above, these strategies included: using direct debit, buying stamps to pay bills in the future, using a key meter, or buying goods and children's clothes through a catalogue. All but the first (direct debit) were associated with worse outcomes in all the nutrition indicators. Those who adopted these latter strategies (40% of the sample) had lower incomes than those who used other methods, and many were claiming Income Support. The people who used these methods for paying bills mostly saw them as good strategies for controlling expenditure and avoiding getting into debt or arrears; the negative consequences for health were what they could not foresee or prevent. The price of controlling expenditure of a very limited budget was inadequate nutrient intake, poorer food variety and healthy dietary patterns, than in those who didn't use these controlling strategies. Recent work by the Policy Studies Institute identified two patterns of money management: cautious, careful control with cost-spreading, which often meant going without food to pay bills, and bill-juggling, used particularly by those who tried not to cut back on food, but who would then hit serious debt crises (Kempson *et al.*, 1994). Any survey would presumably come across people adopting either approach, but a cross-sectional survey such as this one was more likely to find "bill jugglers" who were not in periods of crisis and drastic household expenditure reduction. Thus it appeared that *not* using controlling techniques (such as buying stamps, or using key meters) for IS recipients was associated with better nutritional outcomes. The likelihood is that measurement over a longer period would have demonstrated periodic food shortages with negative nutritional consequences for those households too, as bill and debt crises hit (E. Kempson, personal communication). Future research is planned to explore the inter-relationship between low income, these budgeting strategies and attitudes to food, and their influence on diet and health.

Those who were able to use direct debit facilities, who had higher incomes and bank or savings accounts, generally had better nutritional outcomes than those who did not use such methods. It is not being able to plan and control expenditure that matters, but the balance between expenditure and income.

Shopping: A number of studies have documented food purchase and management strategies people on low incomes adopt (Mack and Lansley, 1984; Cole-Hamilton and Lang, 1986; Dobson *et al.*, 1994; Kempson *et al.*, 1994), all of which were observed in this study too. For instance, people spoke of relying as much as possible on "bargain" offers with judicious use of the freezer, or of occasional bulk buying with friends, and many spent much time and energy trying to shop in particular places for particular bargains. Some had quite limited access to shops or markets, living as they did in isolated, large, local authority run estates with poor shopping facilities and little useful public transport: there are "shopping deserts" even in London (Raven *et al.*, 1995). Parents with young children often walked to shops because buses were difficult to use with pushchairs and shopping, and were therefore limited how much they could carry back on small buggies. People often mentioned using small corner shops, especially for "top-up" purchases of bread and milk, although they knew these places were usually more expensive; many used the local discount shop because it was the only shop nearby, though they also often lamented the loss of a better store or specialist shop (butcher, greengrocer).

However, those who exclusively used discount stores (22% of the sample) had worse nutritional outcomes, as did their children, than those who used other shops² as well, or instead. The quality of food is not necessarily bad in discount stores, although the range of foodstuffs available may be limited. The more likely explanation for this finding is that those who used discount stores exclusively were the poorest: indeed, they were more likely to be in the lowest category of the 'material poverty index, to be in the lowest income quartile, and to be spending much less on food a week, than those who shopped elsewhere. Nine out of 10 were claiming Income Support, (although of those claiming Income Support only 34% exclusively used discount stores; the remainder used a mixture of discount and the bigger chain supermarkets).

²The major five supermarkets: Sainsbury's, Safeways, Tesco's, Asda, Gateway and Argyll, as well as the Co-op and Marks and Spencer.

Managing food stocks: Those living on Income Support wanted to enable their family to eat like everyone else and avoid embarrassment, but they described cooking and meal patterns which used cheap foods cheaply prepared, or sandwiches which require no cooking. Graham (1986; 1993), Dobson and colleagues (1994) and others report similar findings. Many of those interviewed relied on so-called convenience foods, partly for the same reasons as the rest of the population (the foods can be prepared easily and are popular with children) but also because these foods are relatively cheap, acceptable and predictable with no waste and regular portion sizes. People would describe going without a particular food or even meals at times as a consequence of having to pay bills, or would refer to using food stocks as a way of spreading expenditure, or of having to "make a meal" with whatever was left in the cupboard or fridge when there was no money left. (Therefore they had to shop to ensure they have something which they can use when there is no money to buy extra ingredients.)

A lot of people use food management strategies to control expenditure; those in the sample who used the more extreme strategies (regularly skipping meals themselves, particularly lunch, or regularly having to make a meal with whatever was in the cupboard or fridge) had much lower incomes than those who skipped the occasional meal because they were too tired or busy to cook. Those who said they often had to rely on their food stores for family meals because of money, rather than because they had not yet been shopping, had half the weekly income (£109) of those who used their stores for other reasons (£224). A fifth of the sample had to resort to whatever was in their food stores regularly, before they collected their benefit; their income was even lower (£93), and they spent less on food each week than those who only used food stores in emergencies. Those who said they regularly ran out of money for food, and who were constantly worried about not having enough money for food had lower incomes than those who did not have to worry.

Many of these strategies adopted by the poorest parents to manage and control food expenditure had impacts on nutrient adequacy. Parents went without food, or ate more simply than their children, to protect their dependents and release cash for paying bills.

Household integrity was sustained at the expense of the parent's wellbeing.

Discussion: ethos of healthy, "fresh" food

The survey findings suggest that people are distinguishable in terms of how they think and act towards food (shopping, cooking and eating), and that to some extent the differences in attitude are independent of socio-economic circumstances. In the survey the differences in approach were associated with differences in nutritional and food outcomes. People were well able to articulate aspirations about food as a positive aspect of living, associated with pleasure, health, happiness, good social and family relations; this study showed that lone parents tried and often succeeded in putting these aspirations into practice despite limited economic circumstances. Nonetheless, some of those interviewed could not realize such aims in practice because of being on a very tight budget; for them this inability was a source of distress and frustration.

There were also those who showed little interest in food - shopping, juggling family desires and limited money, cooking and sharing, or understanding of its role in health or family life or pleasure. Whether there were, among the poorest, those who had been interested once but had become depressed and worn down by their economic circumstances (as in Dobson *et al.*, 1994), or whether they never had had much interest, is hard to say. There were few income differences between people according to the reasons they gave for buying the food they did, except for those who said they chose food because it was "cheap", who had lower incomes than those who didn't mention price, and always bought the cheapest version of whatever they decided to buy.

For those who were not poor, this lack of interest had no negative outcomes: the weekly chore of the supermarket dash sufficed to satisfy limited desires and nutritional needs where money was no object. For the poorest, this was not true. Their need to keep expenditure low while providing food their children wanted to eat meant spending as little as possible on food: shopping in discount stores for everything and buying food that was always the cheapest they could find. The primary analysis showed that

these strategies had negative nutritional consequences, especially for the parent.

The effects of interest in food extended to cooking: those who regularly cooked from fresh or raw ingredients, rather than opening packets and jars, or having "something on toast", achieved healthier dietary variety for themselves and their children, though there was no association with nutrient intake adequacy. Those who had limited aims - no experimentation, no adventurous shopping or cooking - themselves had much less dietary variety and so did their children. Those who mainly aimed to keep their children happy by buying what they liked to eat had very unhealthy dietary patterns - using children's taste as a guide does not necessarily lead to healthy diets for parents or children.

The interviews threw little light on what made people adopt one ethos rather than another - looking for "fresh" food rather than "what the children will eat", finding time and money to shop other than exclusively in discount stores, and cooking regularly rather than snacking. Why do some people have one attitude, and some another? Do people change their attitudes? What makes them do so? The secondary cluster analysis showed black British, African or Caribbean parents were more likely to say they looked for what was "fresh", as well as what was "cheap" than white Europeans, and less likely than white Europeans to say they tried to satisfy family desires, but ethnicity was not the whole answer. There was no convincing evidence that those with positive dietary aspirations had them because of what they had learnt at school, or because of recent health or nutrition education campaigns.

Apart from long term poverty and the depression it brings, age may play a part; younger parents were poorer and less likely to be employed than older, but they were also much more likely to buy food they themselves liked, and not to be bothered about "value for money" than older parents, who seldom mentioned buying food primarily because they or their children liked it. Is it fanciful to see these younger parents as "children of the Thatcher years", when personal desire was promoted as the paramount motivation for public and private actions, or are they simply a generation not affected

by the Second World War and its aftermath (V. Berridge, personal communication)?

Discussion: ethnicity

Black British, African or Caribbean households had better dietary variety and healthy dietary patterns than white European, and to some extent, better micronutrient status. There has been little research on Afro-Caribbean diets in Britain; anecdotal evidence (Sharma, personal communication) supports the survey's finding that black parents always cooked from raw, fresh ingredients, and provided a highly varied diet for their families. Few other factors could be shown to account for the consistent differences in nutritional outcomes. Black parents worried more than white about running out of money for food, although in fact there were no differences in material circumstances, the amount spent on food, budgeting strategies, food aims or shopping practices, by ethnicity. Black parents in the sample were less likely to smoke than white (as in Marsh and McKay, 1994); they were also more likely to have higher educational qualifications and fewer had none, than white, and were more likely to live in larger households, but the associations were not strong.

Discussion: smoking:

Smokers are known to have less healthy dietary patterns and lower micronutrient status than non-smokers: lower intakes of antioxidant vitamins and lower circulating plasma levels for similar intakes (Whichelow *et al.*, 1988; Margetts and Jackson, 1993; DH, 1994a). They also have much higher risk of fatal coronary heart disease and cancer. Heart disease risk is high for women as well as men: it is the leading single cause of death in women. Women who smoke more than 40 cigarettes a day increase their heart disease risk 20-fold (Marmot and Brunner, 1994). Smokers particularly need to increase their intake of vitamin C, the nutrient which is in fact often lower in smokers' diets (DH, 1994a), as in this survey. The poorest smokers had the lowest vitamin C intakes: 42% of the reference intake, as opposed to 130% in the poorest non-smokers. Smokers' intakes of many nutrients were lower than those of non-smokers, but none was as stark as vitamin C. Poverty made such impact as smoking had on nutrient intakes much worse.

Discussion, policy implications and conclusions

Smokers in this survey were more likely to be unemployed, and living on Income Support, although only 42% of those receiving Income Support smoked. Many described smoking as an antidote to anxiety and stress, or as a way of reducing their hunger pangs: a common finding in surveys of women's health and poverty (e.g. Graham, 1993). The survey was not designed to investigate children's smoking habits, though when asked few said their children did smoke. Other research has suggested that in fact the familial transmission of smoking behaviour is less common in households headed by lone parents than in other households (Green *et al.*, 1990).

Implications for policy

The second objective of this thesis was to contribute to contemporary debate about poverty and potential policy response, particularly where food is concerned. The case study results have a number of implications, for the measurement and definition of poverty; for those who work with low income families; and for policy in general.

Policy: poverty definition and measurement

In the last few years there has been renewed interest in costing "healthy" diets (e.g. Hanes and MacDonald, 1988; Cade and Booth, 1990; Hollington and Newby, 1995), and in constructing food budget standards (e.g. Nelson *et al.*, 1993; Stitt and Grant, 1993). These costings present a challenge to those who seek to define poverty by costing basic minimum needs, but ignore evidence of the real costs that people incur in buying sufficient food for health (the foods they actually choose, costed using the prices poorer consumers have to pay: NCH, 1991; Nelson *et al.*, 1993; in contrast to Henson, 1991; MAFF Food Science Division I, 1992). Scientific or dietetic abstractions of an "adequate, healthy" diet have been used in the past to lower the food cost element in poverty lines (Woolf, 1946; Rivers, 1979), on the grounds that expenditure above these

levels constitutes inefficiency³.

Two implications can be drawn from the present study: firstly, that poor consumers, while having aspirations in common with the rest of society, are nonetheless usually very good at budgeting for food and producing economical meals. Inefficiency has again been shown an implausible explanation for people's inability to eat adequately (e.g. Walker and Church, 1978; Cole-Hamilton and Lang, 1986). Secondly, it contributes to demonstrating the costs to health, measured by increased mortality risk, of setting a minimal standard too low, and the costs to health of living beneath even that minimum standard. The imprecision of reference value choice notwithstanding (Whitehead 1989), ^{consumption below} minimal dietary standards is associated with increasing mortality risk. Nutritionists cannot yet say with certainty that intakes of vitamin C or E below the value X. will lead to $\frac{1}{4}$ risk of death from coronary heart disease or cancer⁴. However, they can point to growing evidence that low (reasonably definable) consumption of fruit and vegetables is associated with increased mortality risk (which might be quantifiable over the next few years?). This study showed the inadequate micronutrient intakes, and unlikelihood of sufficient fruit and vegetable consumption, among parents who live on state benefits for a long time, particularly where deductions are made to the amount of benefit actually received.

One alternative to measuring poverty by minimum incomes is to use deprivation indicators, among which crude estimates of diet have figured (see chapter 1). This study used data from an FFQ to derive Variety Frequency Scores with reasonable

³In practice of course, no quantified poverty line exists in the UK; the only official statistics, LIF (always "low income", never "poverty"), use the level of Income Support as a notional minimum. (The problem with using the level of state benefit as the definition of poverty is discussed widely in the literature (e.g. Veit-Wilson, 1987; Oppenheim, 1993). The argument thus rapidly moves to a justification of the level of Income Support itself, rather than the notional minimum income level it represents. Not only is the debate complicated by the value of passported benefits (such as housing costs, free school meals, etc) which are not available to non claimants (e.g. those on low wages) but the implications of the level being proven too low are immediately costly.

⁴Unlike those who work in the smoking and cancer area, where mortality risk of smoking X a day, and the reduction in risk with Y years of being an ex-smoker, can be quantified.

Discussion, policy implications and conclusions

validation against nutrient intakes and numbers of food items in the weighed intake measurement. The VFS also responded in a similar way to the independent variables as the other dependent variables based on nutrient adequacy. The study was not designed specifically to examine use of these variety indicators in detail, but has demonstrated their potential. FFQs are much quicker and easier to administer, enter and analyse than nutrients, and there is increasing interest in indicators based on *patterns* of diet in predicting health outcomes. Future research should explore the potential of such VFS, both for quantifying risk and as contribution to indicators quantifying deprivation.

In addition, there is evidence that as people live exclusively on benefits for longer periods of time they become increasingly excluded from accepted ways of living in British society. The study points the way to indicators of food aspects of this exclusion: having to use the store cupboard to feed the family on a regular basis because there is no money left; having regularly to borrow food or money for food; the type of food people eat (no fruit, meat of mince, sausages or chicken only, etc).

Policy: workers with low-income families

Food: One positive implication of the survey is that low income parents can make a difference to their children's nutritional well-being and to some extent their own, by their attitudes towards shopping, cooking and eating. It is not clear from the research whether these attitudes are learned, nor how they change or why, but it does seem that attitudes and practices can have effects on diets, even for those claiming benefits, or for smokers' families. Many small scale projects already exist in the UK (Leather and Lobstein, 1994) which work with low-income households to enable them to obtain and eat healthier food; many specifically aim to change attitudes to food or enable participants to realize their aspirations. The survey results strengthen the premise of such projects: that grassroot activity can make some difference to low-income households' food circumstances. Nonetheless, they do not take away the effect of being poor: diets *were* worse in poorer households, and they can never be a substitute for activities directed at wider issues of access and information.

Until the end of 1995, no central database existed covering such projects and activities, many of which have precarious funding and existence, and few of which are accessibly documented⁵. A national information and support network for workers and project teams involved in food and low income is one recommendation of the Low Income Project Team⁶ (DH, 1996 in press). Networks could also offer advice and support on monitoring and evaluating small projects, a practice which has hardly begun (Williams and Dowler, 1994).

Smoking: For those in the poorest households, smoking is the easiest, locally approved, legal anodyne to deal with discouraging circumstances (Marsh and McKay, 1994). Graham, among others, has documented at some length why poorer people, and women in particular, smoke (Graham, 1988, 1990, 1993) and the implications for policy. In low income households, tobacco expenditure is seen more as a necessity than a luxury; cigarettes (for those who smoke) are a way of coping with immediate and long term stresses (children to contain and entertain in small flats, bills to pay).

People who choose to give up smoking do so for reasons to do with optimism and self esteem: the poorest with little of either therefore find it hardest to do. People may be able to cut down cigarette expenditure to pay an immediate bill; they cannot necessarily cut it out altogether. In contrast to much of the current health promotion literature (e.g. Jacobson, 1994) Marsh and McKay (1994) argue for reductionⁱⁿ tobacco tax because it hits poorest households most, or for measures aimed at helping low income families give up (e.g. nicotine gum and patches available on prescription, and therefore free to Income Support or Family Credit claimants).

⁵Recent sources of information include: a review by Dowler and Rushton (1993) for the Nutrition Task Force, Department of Health; a review by J. Francis, A. Busby and R. Howarth (unpublished, 1994), Caledonian University, with funding from the Glasgow Fashers and Meat and Livestock Commission; Williams and Dowler (1994) (with extention by J. Buttriss, C. Williams and J. Stordy, unpublished); and Leather and Lobstein (1994) as part of their work for the National Food Alliance Low Income and Diet pack.

⁶Funding has recently been obtained by the National Food Alliance from the UK National Lottery Charities Board (the 1995 focus was on anti-poverty initiatives) for a database for England in conjunction with the Health Education Authority and a newsletter to service such a network. A similar initiative has begun in Scotland (A. Anderson, personal communication).

Discussion, policy implications and conclusions

Budgeting strategies: Using catalogues, stamps and key meters to control and spread payments for essentials is regarded as efficient money management, to avoid or reduce debts and arrears. The implications for food - the "flexible" budget item - have not been apparent until this survey: these strategies have severely negative nutritional consequences. Weekly small expenditure on the UK national lottery (which did not exist at the time of the survey) may be exacerbating these problems.

Policy community:

This section begins with a brief review of the policy arena on lone parents, since they were the focus of the case study. Then key issues to be addressed by the policy community are outlined, with potential response from different sectors. This leads to a brief review of current and potential activities, with discussion of the policy agenda formation.

Lone parents: There is no nutrition policy directed specifically at lone parents, nor is there likely to be. Social policy has to some extent in the past attempted to address the poverty which many lone parents experience: a non means-tested supplement to universal child benefit and less discouragement from working by means-tested benefit rules. Currently, the fragility of family life is on the political agenda. The focus seems to be on trying to prevent lone parenthood, or at least, poverty-stricken lone parenthood, from occurring by penalizing those experiencing it. The Child Support Agency was created to reduce lone parents' dependence on Income Support, but has probably not increased their income from the absent parent (see chapter 3). Single, never married, young lone mothers are threatened with loss of entitlement to housing and even to benefits; and policy instruments sought to reverse the trend towards cohabitation and divorce as "normal ways of life" and to reassert within the national psyche the "traditional family" as a basis for bringing up children. It seems unlikely these aims will be realized.

The remaining focus of this chapter is food and poverty in general, rather than specifically addressing needs of lone parent households.

Discussion, policy implications and conclusions

Nutrition policy issues: As outlined in chapter 2 the nutrition policy agenda is usually dominated by national supply issues and to a lesser extent by food as a component of health outcomes - part of the maintenance of human capital. Wider issues of access and availability are seldom addressed, and are often considered outside nutrition's domain: income (including within household distribution, a topic not addressed by the case study) and its sufficiency for adequate food; management of household expenditure; cost of food (especially the costs of a "healthy" diet); where shops and markets are, what they stock, who can reach them; food marketing control. Nutrition's remit is usually limited to instruments located in the sphere of individualized behaviour, to influence commodity purchase: promotion by private and public (health) sectors, and food claim, ingredient and nutrient content labelling. Where market failure occurs, nutrition policy becomes involved in welfarism - distributing basic goods to those who cannot otherwise obtain them. In the UK, only free school meals, vitamins and milk to children of Income Support claimants arguably come into this category.

There has been occasional discussion of other welfarist possibilities, such as food stamps. While these supposedly ensure expenditure on appropriate goods (food rather than, say, tobacco) and could conceivably be used for prescribed commodities (such as fruit, vegetables, or low fat meat) the scope for such an initiative seems small (Winstanley and Dowler, 1993). There is no history of using such a policy instrument in the UK, apart from experience with food ration books during and after the Second World War. Rations are different from stamps, not least in that the commodity is precisely not rationed under a stamp scheme, but sufficient lay memory of "books and coupons" and queueing might exist to damage any scheme. In addition, a black market would rapidly develop, and any attempt to prescribe food patterns would be subject to evasion.

In the present survey, respondents were asked their opinions of food stamps (theoretically given in addition to, or as part of, their present means tested benefit); the majority said they would find it demeaning to use them ("everyone would know your

business: I'd rather have money") but would do so nonetheless. Many also added that they might be a good idea because they knew X and Y who didn't budget very well, so that at least with food stamps "their kids might get fed properly"; they often also added that X and Y would probably find a way round them. There was a great deal of realism about the shortcomings of such a scheme. Indeed, experience in Glasgow of distributing money-off coupons for specified "healthy" items (brown bread, chicken, fruit) suggests that such initiatives only work when accompanied by linked, specific health promotion activities and high motivation in the recipient group (Cresswell, 1993).

School meals play an important part in the diets of children from low income households, and arguably bridge supply/availability and welfare provision. However, current changes in the way school meals and education budgets are being organized and managed do not confer confidence that "healthy options" will remain accessible (Williams, 1994). School meals are an easy target for cost-cutting measures. A statutory requirement for schools to provide a free meal to entitled children exists, but there is no requirement stipulating that meal's contents. Reducing free school meals to cheap snacks would not meet the needs of children from low income households, many of whose parents rely on good food provision (as in the survey). If schools reduced lunch provision to free meals only, take-up would probably decline even further than at present (take-up is below entitlement rates) with greater stigma attached to taking up the free meal.

School lunches are important for children other than those entitled to free meals; many low income parents rely on their children having a mid-day meal (Sharp, 1992; White *et al.*, 1992; Williams, 1994). Coles and Turner (1994) argue that young people of all ages often have coherent and sensible ideas about diet and health which schools need to encourage and promote, not least in the way school meals are provided. The Expert Working Group on School Meals (Sharp, 1992), among other policy proposals, called for the reinstatement of nutritional guidelines for school meals, to contribute to a healthier diet for children.

Discussion, policy implications and conclusions

During 1994-5, a focus for activity has been the Low Income Project Team⁷ (LIPT; see chapter 2). Their original terms of reference were partially realized in the NFA Food and Low Income pack (Leather and Lobsetin, 1994; see chapter 2). Their remit was subsequently therefore agreed to be: *"to review and evaluate the conditions affecting outcomes of projects and initiatives which enable those on low incomes to obtain and eat a healthy diet, and to propose effective intervention in government, private and public sectors"* (DH, 1996, in press). Thus the original restriction to "local projects" was breached; wider issues could be addressed. The Working Paper introduced ideas about access and entitlement (figure 7.1 is derived from the framework used) but income, wages and jobs, and the balance of competing expenditure demands were of necessity reduced to "money for food" in the figure used (Williams and Dowler, 1994). The omission of means tested benefit levels adequacy from LIPT's terms of reference was mentioned above; minimum wage legislation or job creation schemes were not on the agenda either. None of these issues could be raised or discussed at the main Project Team meetings.

The thesis case study survey results contributed to the Project Team's review of the relationship between diet and low income, and to some extent to the proposals for action. People on low incomes need access to a range of shops with competitive pricing which is not simply achieved at the expense of range of food stuffs. Members of low income households usually cannot afford to shop for more than one week's needs; they cannot add a taxi fare to food costs every week; they cannot always undertake difficult bus journeys. Discount stores, which play an important part in enabling poorer households to achieve any reasonable nutrition levels, need to consider their range of commodities; for instance, fresh fruit and vegetables are usually only available on franchise, often with limited variety on offer.

⁷The Low Income Project Team (LIPT) was set up in June 1994 by the *Nutrition Task Force* to The Health of the Nation. Representation on LIPT includes the Institute of Grocery Distribution, the National Consumer Council, National Dairy Council, British Dietetics Association, the Health Education Authority, Health Visitors, Citizen's Advice, academics from various universities with experience in nutrition, retailing, consumer and the voluntary sector, and policy division staff from MAFF, DH, and The Report in press, to be published in March 1996. *with a DSS representative as observer.*

Discussion, policy implications and conclusions

A further specific set of initiatives from the Low Income Project Team will be the creation of local public/private sector food partnerships, linking voluntary sector initiatives with local authority plans and local business needs. A mechanism for dialogue between these actors, health trusts and local chambers of commerce, might at least keep the food needs of low income consumers on a central and public agenda (DH, 1996, in press). Ideally they could work to initiate and sustain innovative schemes to create diversity in local shopping possibilities (mobile shops, direct marketing schemes, support for food cooperative ventures).

This is not to deny the present problems for those engaged in food marketing. The sector is highly competitive; neglect by the UK major supermarkets of low income consumers has left a sizeable market gap, which the European major discount operators have moved to fill at speed. The UK supermarkets are currently engaged in cost-cutting competition on basic goods, and customer loyalty cards with money saving offers. Few of these arguably affect the food circumstances of really low income households. In addition, food market operations are increasingly global (Tansey and Worsley, 1995; Raven *et al.*, 1995); quite apart from the connections to poverty in non-industrialized countries, low income consumers in the UK are likely increasingly to have much in common with low income consumers throughout Europe - because of the future structuring of employment and welfare benefits, and because of the nature of food retailing.

health policy agenda: Initiatives to date were described in chapter 2. The Chief Medical Officer's Variations Sub-Group to the Health of the Nation Working Group recent report (DH, 1995) stresses that *"everyone should have the opportunity to attain their full potential for health. Variations indicate the extent of potentially preventable ill-health and premature death"* (DH, 1995, p1) and that *"action to tackle variations in health is central to the achievement of the government's Health of the Nation strategy"* (DH, 1995, p3). This statement is a significant recognition of the importance of acknowledging and working to reduce socio-economic differentials, although the Working Group was restricted to looking at NHS and DH responses only (Wilkinson,

Discussion, policy implications and conclusions

1995b). The report comments on the value of much existing work within health authorities and the DH, but that it is often marginal, uncoordinated and unevaluated. The report calls for creation of alliances, monitoring and evaluation, and improvement of coordination. The parallels with the LIPT report (DH, 1996, in press) are striking - though LIPT is bolder in its inter-sectoral reach: nutritionists are used to crossing boundaries.

Social policy: The present study challenges the assertion by the Department of Social Security that the level of benefit available "*while not generous [...] is adequate for day to day living*" (Roger Evans, Parliamentary Under Secretary of State for Social Security, letter to Lady Wilcox, National Consumer Council Chairman, 16th November 1994) - an assertion that has been made continuously over the years (see Woolf, 1946; Walker and Church, 1978). Notwithstanding claims that a healthy diet need not cost more than an unhealthy one (e.g. MAFF, 1992; Groom, 1993), and that large changes in food patterns would be required whatever the level of income or spending to achieve a healthy diet (ditto), the survey results demonstrate that those who live in the poorest conditions, and have lived in them for some time, cannot afford to eat healthily.

"We have no evidence that people are not able to survive on income support. We have no evidence that people cannot survive even when deductions are being made from income support."

(Parliamentary Under Secretary of State in 1991, during the debate on introduction from income support for child maintenance: Lords Hansard, 16 May, 1991 col 1842, quoted in NACAB, 1993.)

Automatic deductions from benefit and systems for safeguarding utilities' income (key meters) are usually applied to those who have had arrears and debts. Automatic deductions for child maintenance are made to reduce state expenditure on social security (Garnham and Knights, 1994). Contrary to the views expressed in the Lords in 1991, there is now evidence that people cannot survive when deductions are made from income support. These deductions have severe costs in terms of parents' health: people simply could not afford the food they needed, when so much of their limited

Discussion, policy implications and conclusions

income was absorbed by fixed costs. Much the same would apply to Social Fund loan repayments, which few faced in this survey, or child maintenance orders deducted from benefits, which had not come into action at the time of the survey.

There seems little realistic future in arguing for benefit level increases: the cost of unemployment and income support has increased over the last decade or so (Hills, 1993)⁸ and is unlikely to decrease while unemployment remains high and family life fragile. However, ring-fencing within the benefit level for food and essentials' costs is a feasible option to prevent deductions from reaching the unmanageable proportions they currently do.

In the wider term, getting people off long term reliance on means-tested benefits is the most desirable option, for the state and for claimants themselves. Despite some positive statements from independent policy analysts over future potential directions (e.g. Joseph Rowntree Foundation, 1995), there is much pessimism within the social policy community over the likelihood that present government initiatives will serve that function (Dobson and Walker, 1995; Hutton, 1995). The irony is that many initiatives to help people off benefits - not least the creation of a "flexible workforce" - in fact make their financial circumstances worse through loss of passported benefits, and, for those with dependent children, because of child-care costs. Many poor wage earners in fact do better to stay on means tested benefits, rather than juggle low wages or part-time work, often also badly paid and for hours that are below the statutory minimum to qualify for national insurance, sick pay, pensions, with child care costs.

The future of the welfare system itself is currently under official and unofficial scrutiny. The Chief Secretary to the Treasury is leading a review of public spending in social security, health and welfare; the Labour Party's Social Justice Commission

⁸The total Social Security bill is £85bn, of which £29bn is for basic retirement pensions, £1.26bn for Unemployment benefit, £16bn is for Income Support, £10.25 is for Housing benefit, £2bn for Council tax benefit, and £6.1bn for Child benefit (£289m for One-parent benefit). Of the total benefit bill, £38bn is spent on the elderly, £19bn on the long-term sick and disabled, £16b on families and more than £9bn on the unemployed (Nicholas Timmins: "Who gets what" Independent on Sunday, 24th Sept 1995, p18).

Discussion, policy implications and conclusions

reported in 1995. Said to be at issue is that the present system, created in 1942, was predicated on the majority being in full-time employment for much of their working lives. Earnings enable people to contribute to national insurance and pension schemes. Where unemployment or part-time, low paid work is increasingly common people do not make such contributions: the total amount of money available derives from fewer and fewer people; fewer and fewer secure entitlement to anything but the most basic support. There is debate about projections and the implications of economic models used. For instance, Hills (1993) argues that Britain's welfare spending has in fact been stable over the medium term as a proportion of GDP, and that projections of rapid upward growth are alarmist. However, he accepts the upward pressures from an ageing population (more to be spent on pensions and supplementary Income Support) and rising numbers of lone parents; he points out that welfare spending checks have been achieved by cutting benefit levels and access to provision. Field, chair of the Commons Select Committee on Social Security, in his recent review of welfare (1995) acknowledges a further problem with welfare as currently constructed (that people are encouraged to maximise their income while remaining on welfare - i.e. to cheat) and argues for radical reform that harnesses people's self-interest and wish for self-improvement in obtaining an income that does not come through welfare (Field, 1995, pp42-3). The review has been generally welcomed; the set of solutions (expanding a national insurance scheme, with potentially authoritarian anti-fraud measures) has had a less enthusiastic reception.

What other potential exists for raising and maintaining nutrition as an aspect of poverty on the social and political agenda? Initiatives within government in response to calls from non-governmental or professional groups can be traced, and could be maintained; the National Food Alliance and Scottish food poverty networks, and local private/public sector food partnerships can sustain momentum at national and local levels. The LIPT report (DH, 1996, in press) makes recommendations for a national strategy on food and low income, with co-ordination of specific proposals for action by key central and local government players, as well as others involved in food and low income initiatives.

Nutrition intervention in the UK as elsewhere has seldom been seen as a component of social justice or human rights. These are difficult areas to articulate in the contemporary UK climate. Alston (1994) discusses problems in a general context, in terms of international conventions and law (*"food is first and foremost a commodity which is traded annually for billions of dollars and its status as a human right is very much secondary"*, Alston, 1994, p206). He cites Article 11 of the International Covenant on Economic Social and Cultural Rights, formally accepted by 74 states in September 1982, which recognizes *"the rights of everyone to an adequate standard of living for himself and his family, including adequate food, clothing and housing, and to the continuous improvement in living conditions"* (Alston, 1994, p208). As Alston says, while the basic norm is thus clearly laid out, operationalization is less formally stated, and may be - is often - ignored. However, he also argues that states, having made formal commitment progressively to provide adequate food (which he interprets as culturally and nutritionally acceptable), have obligations to fulfill these domestic duties, obligations for which they can be held accountable. Whether any individual or group acting on behalf of individuals (such as the homeless, for instance), could use such an argument in court of law is a moot point.

Alcock (1991), in a discussion of the history and present perspectives of rights to welfare services in the UK, highlights the focus in the European Union's Social Charter on "rights" as a vehicle for social policy objectives. O'Neill (1994) examines further the difficulties of conceiving and operationalizing "rights" in terms of food or welfare access. Utilitarianism, she argues, which is the traditional focus of human rights (as freedom from interference), simply allows the market to determine the greatest happiness of the greatest number - omitting any ranking of misery: very much the principle of Thatcherism. O'Neill cannot bring herself to accept theories of human rights to welfare or basic needs much as she would like to, but argues instead for universalizing constructions developed from Kantian principles - a theory of human obligations - with focus on actions rather than *laissez-faire*, and which can encompass principles of human need. However, all needs, of all people, for all time cannot be met; ranking and prioritizing is now possible. Gray (1995), a former advocate of

Thatcherite market economics, seems now similarly convinced that policies which specifically address the needs of the poor are necessary to construct a society which meets all human welfare needs: the market is no longer a vehicle to bring them about.

The preamble to the ESRC research Programme on Health Variations launched in July 1995, states:

"Social differentials in health and life expectancy have been documented since [British] official statistics were first published 150 years ago. It is disturbing to find there are not only still large and systematic differences between social groups but that these gaps are widening. [...These] data [...] do not just raise questions about social equity and health as a human right. [They] have profound implications for social and economic development and, more generally, the quality of life."

The ESRC, prepared to invest £4 million over five years to investigate the reasons for socio-economic variations in health experience and outcomes, sees these variations as having implications both for individuals and society, in terms of social justice and human rights, and in terms of productivity and human welfare. The programme calls for the mechanisms of variations be elucidated and potential policy interventions to be assessed. To some extent the ESRC seem also to be promoting a less oppositional approach between "behaviouralist" (people eat the wrong things, smoke too much, take too little exercise) and materialist explanations (the cumulative impact of inadequate housing, low income, poor education, job insecurity and poor pension provision, with contingent restricted food choice and poor diets).

There is as yet no comparable research programme looking at what can be done for food and poverty, although the LIPT Report raises a number of possibilities. Food issues are, as usual, having to dovetail into reducing public health differentials (human capital). Yet poor households in the UK have fewer choices open to them than richer in their coping strategies to contain poverty, and food is where they mostly reduce expenditure, with consequences for the health, well-being and survival of individuals, and for the quality of economic and social life.

"I normally buy four packets of bread, [but if I'm running out of money for food] we just buy two. So those who have 6 slices I tell them to take 4, those taking 4 I tell them to take 3 and I don't eat. [...] When we don't have enough, say one boy comes and says, 'Mummy I'm hungry', and I say, 'wait until the others come and we can divide it', or if he's badly hungry I give him a portion and say, 'don't take anymore - the rest has to go to the other children'. He says, 'Mummy trust me'. [...] sometimes I lie to them (then) they say, 'Mummy, don't we know you're are trying to keep us alive, but don't starve yourself, let's share it'. They are very good children, they understand".

(Lone parent, aged 40+ years, claiming Income Support with dependent and non-dependent, unemployed children living at home).

APPENDIX 1

QUESTIONNAIRES

1. First Contact Questionnaire
two prompt cards for First Contact Questionnaire (income; ethnicity)
2. Logbook for recording food intakes:
example day
recipe example day
pages to record standard household measures of milk, sugar, spreads
3. Food Frequency Questionnaire
("afford" column was ignored)
4. Long taped interview schedule
two prompt cards for Long Interview (income; expenditure)

FIRST CONTACT QUESTIONNAIRE

1. Household ID No. |_|_|_| 2. First name _____

3. Date of interview _____

4. Could you tell me your household details, that is all the people who share the same housekeeping budget.
(include any family and friends)

	Name	Relationship to you	Sex	Age	job/school
0.	_____	_____	_____	_____	_____
1.	_____	_____	_____	_____	_____
2.	_____	_____	_____	_____	_____
3.	_____	_____	_____	_____	_____
4.	_____	_____	_____	_____	_____
5.	_____	_____	_____	_____	_____

5. Are there any other people living here all the time, such as lodgers? (sleep here).

6. What is your present marital status?

1. Single (never married)	-
2. Separated	-
3. Divorced	-
4. Cohabiting	-
5. Married	-
6. Other _____	-

7. What education establishments have you been to?

1. No formal education	-	5. Poly/University	-
2. Elementary/ Primary	-	6. Evening classes	-
3. Comprehensive/ Secondary	-	7. Other _____	-
4. Vocational/ Technical ST/PT	-		

9. Could you tell me what qualifications you've got?
(educational and professional)

- | | | | |
|----------------|--------------------------|-----------------------------|--------------------------|
| 1. CSE | <input type="checkbox"/> | 5. Technical/Professional | <input type="checkbox"/> |
| 2. GCE/O level | <input type="checkbox"/> | 6. Degree/ Higher degree | <input type="checkbox"/> |
| 3. GCSE | <input type="checkbox"/> | 7. Vocational (Teach/Nurse) | <input type="checkbox"/> |
| 4. A level | <input type="checkbox"/> | 8. None | <input type="checkbox"/> |

Details _____

10. Are you currently working/in paid employment?

1. Yes ☐ 2. No ☐

11. Do you work more than 30 hours a week or less?

- | | | | |
|-------------------------|--------------------------|-------------------------|--------------------------|
| 1. > 30 hours/week (ft) | <input type="checkbox"/> | 3. Irregular employment | <input type="checkbox"/> |
| 2. < 30 hours/week (pt) | <input type="checkbox"/> | 4. Other | _____ |

12. What job do you do now?

13. Have you had any 'on the job' training? (computing, typing, childminding)

14. Can you look at this list and tell me which letter your income is in?

Roughly how much money comes to you each week? please include all benefits and maintenance (net of tax, NI and Superann. etc;)

15. Is your income fairly steady? 1. Yes ☐ 2. No ☐

16. I'm going to go down a list of benefits. Can you tell me which you think you get. Could you say what day you receive each benefit and how often?

	YES	NO	DK	DAY	FREQ
1. One Parent Benefit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
2. Child Benefit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
3. Income Support	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
4. Family Credit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____

16. Do you get any of the following on behalf of your children?

	YES	NO	DK
1. Free school meals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Free vitamin tablets (under 5's)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Milk tokens (under 5's)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Other _____			

17. How long have you been in your present financial circumstances? Is it less than 6 months, less than a year, more than a year?

1. < 6 months ☐ 2. 6 - 12 months ☐ 3. >12 months ☐

18. Do you receive maintenance payments for your child/ren?

1. Yes, regularly	<input type="checkbox"/>	3. Lump Sum	<input type="checkbox"/>
2. Yes, occasionally	<input type="checkbox"/>	4. No	<input type="checkbox"/>

19. Do you receive maintenance payments for yourself?

1. Yes, regularly	<input type="checkbox"/>	3. Lump sum	<input type="checkbox"/>
2. Yes, occasionally	<input type="checkbox"/>	4. No	<input type="checkbox"/>

20. What type of housing tenure do you have?

1. Own outright	<input type="checkbox"/>	5. Private rent	<input type="checkbox"/>
2. Mortgage	<input type="checkbox"/>	6. Living with family	<input type="checkbox"/>
3. LA rent (council)	<input type="checkbox"/>	7. Living with friends	<input type="checkbox"/>
4. HA rent	<input type="checkbox"/>	8. B & B, homeless	<input type="checkbox"/>
9. Other _____			

21. How would you describe yourself ethnically?

22. How would you describe your child/ren ethnically?

FIRST CONTACT QUESTIONNAIRE: INCOME PROMPT
TOTAL INCOME PER WEEK

(approximately)

please say which letter your weekly income is in

A about £50

E £125 - £149

I £225 - £249

B £50 - £74

F £150 - £174

J £250 - £274

C £75 - £99

G £175 - £199

K £275 - £299

D £100 - £124

H £200 - £224

L £300 +

FIRST CONTACT QUESTIONNAIRE: ETHNICITY PROMPT

Bangladeshi

Black - African

White - British

Chinese

Black - British

White - Irish

Indian

Black - Caribbean

White - other

Pakistani

Black - other
(please describe)

(please describe)

any other ethnic group
(please describe)

EXAMPLE DAY LOGBOOK FOR RECORDING FOOD INTAKE

Todays Date Friday 6th March 1992

Time Served	Description of food or drink start each item on a new line	Initials	age	Initials	age	PLEASE LEAVE BLANK					
		<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
8.00am	Tesco's Longfakes milk			46g 110ml	1dsp						
	sugar			2tsp							
	Mighty White bread (medium)	2s1									
	Margarine (Tesco)	✓									
	Marmalade	✓									
10.30am	Happy Shopper Plum Jam	✓									
	Tea										
	Gabburys Choc. Buttons	3		50g							
	Condensed Creams (Tesco)	✓									
	Tea										
12 noon	Orange Squash (Diluted)			1 glass							
	Heinz tinned tomato soup (450g can all used)	1/2 can		1/2 can							
	Mighty White bread	2s1		1s1							

RECIPES EXAMPLE DAY

Today's Date

Friday 6th March 1992

Name of Dish

Pizza

Write down all the recipes of prepared dishes.
Weigh or measure ALL the ingredients used.
State brief preparation and cooking instructions.

230g Texaco Pizza base

200g chopped tomatoes (can)

2 tsp tomato puree

36g onion (chopped)

1 clove garlic

pinch herbs (mixed)

56g mushrooms raw

29g green pepper

35g vegetable oil

50g cheese

The onion, garlic and mushrooms were fried in the oil. Then the pepper was added and fried.

10

The tomatoes were spread on the base, then the fried ingredients were put on top. Grated cheese was added and the pizza was baked in the oven.

Weight of whole pizza after cooking = 553g

11

FROM LOGBOOK FOR
RECORDING FOOD INTAKE

Fill this in on _____ night.

Please weigh a typical cup of each

Initials of each person	Tea		Coffee	
	weight milk	weight sugar	weight milk	weight sugar
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

2. What type of milk will you use for these 3 days?
Put a nng round answers

Whole milk	Semi-skimmed	Skimmed	Dried
------------	--------------	---------	-------

- 3** What type of bread do you have at the moment?
Put a ring around an answer in each column

Lame loaf (800g)

Small load (4000,

This chart

Mediunt: 31.05.20

11/11/2011

Extra thick sliced

Unshred

... leaf

brunner

Cottage

Rolls

Cobs

Homemade

Put the tea or coffee without any milk or sugar on the scales

Press 'ON' wait for 'ZERO' add milk write down the weight

Press 'ON' wait for 'ZERO' add sugar, write down the weight

14

15

Fill this In last thing on 11/11 — evening!

If you use these things most days, weigh the tub or pot at the start and at the end. Put a tick in the diary record to show when it was used and by whom.

late Sat ↓

late Tues ✓

Write brand name here next to name of food	
1.	Margarine (soft or hard)
2.	Butter
3.	Low fat spread
4.	Marmalade
5.	Jams
6.	Honey
7.	Peanut Butter
8.	Chocolate spread
9.	Marmite
10.	Any other spread
11.	Pickle
12.	Chutney
13.	Tomato Ketchup
14.	Brown Sauce
15.	Chilli Sauce
16.	Soy Sauce
17.	Any other sauce

Weight at start of day 1 (g)	Weight at end of day 3 (g)	Difference PLEASE LEAVE BLANK

18. Looking Oil

12

13

FROM LOGBOOK FOR RECORDING FOOD INTAKE

FOOD FREQUENCY QUESTIONNAIRE

Household ID No. |_|_|_|_| Date |_|_| |_|_| |_|_|

First name + surname initials _____

Answer as for your current circumstances.

I'm going to go through a list of foods. Can you tell me if you ever eat them, and if so, how often?

	md	1-2wk	2-3mth	Occ	Never	Afford
1. white bread						
2. brown bread						
3. granary/wholemeal						
4. crispbread/ryvita						
5. cream crackers etc;						
6. chappatti, nan, pitta						
7. white rice						
8. brown rice						
9. flour - cakes						
10. flour - pastry						
11. flour - sauces						
12. Other						

Do your child/ren ever eat any of the following?

	md	1-2wk	2-3mth	Occ	Never	Afford
13. white bread						
14. brown bread						
15. granary/wholemeal						
16. crispbread/ryvita						
17. cream crackers etc;						
18. chappatti, nan, pitta						
19. white rice						
20. brown rice						
21. flour - cakes						
22. flour - pastry						
23. flour - sauces						
24. Other						

Do you ever eat any of the following and if so, how often?

	md	1-2wk	2-3mth	Occ	Never	Afford
25. Pasta						
26. Tinned pasta						
27. Homemade pizza						
28. Frozen pizza						
29. Shop-bought pizza						
30. Other						

Do your child/ren ever eat....

	md	1-2wk	2-3mth	Occ	Never	Afford
31. Pasta	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. Tinned pasta	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. Homemade pizza	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. Frozen pizza	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35. Shop-bought pizza	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36. Other _____						

Do you ever eat....

	md	1-2wk	2-3mth	Occ	Never	Afford
37. Bran cereals/Allbran	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38. Frosted/ choc.coat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39. Cornflakes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40. Weetabix/Shred.Wheat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41. Muesli	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
42. Other _____						

Do your child/ren ever eat...

	md	1-2wk	2-3mth	Occ	Never	Afford
43. Bran cereals/Allbran	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
44. Frosted/ choc.coat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
45. Cornflakes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
46. Weetabix/Shred.Wheat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
47. Muesli	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
49. Other _____						

Do you ever eat

	md	1-2wk	2-3mth	Occ	Never	Afford
50. Baked beans	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
51. Red kidney T D	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
52. Black-eye T D	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
53. Haricots T D	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
54. Lentils & Split peas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
55. Cow peas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
56. Other _____						

Do your child/ren ever eat....

	md	1-2wk	2-3mth	Occ	Never	Afford
57. Baked beans	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
58. Red kidney T D	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
59. Black-eye T D	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
60. Haricots T D	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
61. Lentils & Split peas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
62. Cow peas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
63. Other _____						

Do you ever eat

	md	1-2wk	2-3mth	Occ	Never	Afford
64. Nuts (cooking/meal)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
65. Nuts (salted/snack)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
66. Soup Tin F Dri	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
67. Sauces Tin F Dri	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
68. Other sauces	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Do your child/ren ever eat.....

	md	1-2wk	2-3mth	Occ	Never	Afford
69. Nuts (cooking/meal)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
70. Nuts (salted/snack)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
71. Soup Tin F Dri	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
72. Sauces Tin F Dri	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
73. Other sauces	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Do you eat.....

	md	1-2wk	2-3mth	Occ	Never	Afford
74. apples F T	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
75. pears F T	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
76. citrus F T	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
77. peaches/nectar.F T	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
78. plums F T	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
79. kiwi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
80. melon	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
81. grapes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
82. pineapple F T	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
83. tropical (mango)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
84. banana F D	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
85. strawberries F T Fr	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
86. berried fruit F T Fr	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
87. rhubarb F T Fr	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
88. Dried fruit (sultana)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
89. Other fruits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Do your child/ren eat.....

	md	1-2wk	2-3mth	Occ	Never	Afford
90. apples F T	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
91. pears F T	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
92. citrus F T	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
93. peaches/nect.F T	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
94. plums F T	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
95. kiwi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
96. melon	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
97. grapes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
98. pineapple F T D	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
99. tropical (mango)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
100. banana F D	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
101. strawberries F T Fr	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
102. berried fruit F T Fr	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
103. rhubarb F T Fr	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
104. Dried fruit (sultana)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
105. Other fruits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Do you eat.....

		md	1-2wk	2-3mth	Occ	Never	Afford
106. sprouts	F T Fr						
107. cabbage/greens	F Fr						
108. cauliflower	F Fr						
109. spinach	F T Fr						
110. broccoli	F Fr						
111. leeks	F Fr						
112. okra	F T D Fr						
113. courgette	F Fr						
114. aubergine	F T Fr						
115. green beans	F T Fr						
116. peas	F T D Fr						
117. carrots	F T Fr						
118. parsnip	F T Fr						
119. swede	F T Fr						
120. turnip	F T Fr						
121. mixed veg.	T Fr						
122. onions	F T D Fr						
123. plantain							
124. yam							
125. sweet potato							
126. pots-boiled							
127. pots-mashed							
128. pots-chipped							
129. pots-roast							
130. pots-jacket							
131. tinned pots.							
132. pots-instant							
133. oven chips							
134. peppers	F T D Fr						
135. tomatoes	F T D						
136. olives							
137. sweetcorn	F T Fr						
138. mushrooms	F T D Fr						
139. lettuce							
140. watercress							
141. beetroot	F bottled						
142. cucumber							
143. spring onion							
144. radish							
145. celery							
146. avocado							
147. Other							

Do your child/ren eat.....

		md	1-2wk	2-3mth	Occ	Never	Afford
148. sprouts	F T Fr						
149. cabbage/greens	F Fr						
150. cauliflower	F Fr						
151. spinach	F T Fr						
152. broccoli	F Fr						
153. leeks	F Fr						
154. okra	F T Fr						

155. courgette	F	Fr						
156. aubergine	F	T	Fr					
157. green beans	F	T	Fr					
158. peas	F	T	D	Fr				
159. carrots	F	T	Fr					
160. parsnip	F	T	Fr					
161. swede	F	T	Fr					
162. turnip	F	T	Fr					
163. mixed veg.	T	Fr						
164. onions	F	T	D	Fr				
165. plantain								
166. yam								
167. sweet potato								
168. pots-boiled								
169. pots-mashed								
170. pots-chipped								
171. pots-roast								
172. pots-jacket								
173. tinned pots.								
174. pots-instant								
175. oven chips								
176. peppers	F	T	D	Fr				
177. tomatoes	F	T	D					
178. olives								
179. sweetcorn	F	T	Fr					
180. mushrooms	F	T	D	Fr				
181. lettuce								
182. watercress								
183. beetroot	F	bottled						
184. cucumber								
185. spring onion								
186. radish								
187. celery								
188. avocado								
189. Other								

Do you use the following on bread and if so, how often?

	md	1-2wk	2-3mth	Occ	Never	Afford
190. butter						
191. soft marg. _____						
192. hard marg. _____						
193. low fat spread						
194. very low fat spread						

Do your child/ren use the following on bread and if so, how often?

	md	1-2wk	2-3mth	Occ	Never	Afford
195. butter						
196. soft marg. _____						
197. hard marg. _____						
198. low fat spread						
199. very low fat spread						

How often do you use the following fats/oils for cooking?

	md	1-2wk	2-3mth	Occ	Never	Afford
200. butter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
201. soft marg. _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
202. hard marg. _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
203. lard	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
204. veg/nut oil	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
205. olive oil	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
206. other _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

How often do you and your child/ren use milk?

	md	1-2wk	2-3mth	Occ	Never	Afford
207. milk(parent)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
208. milk(child)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

209. Roughly how much milk do you and your family use a week?

210. What type of milk do you usually buy?

full cream ☐ skimmed ☐ tinned ☐
 semi-skimmed ☐ dried ☐

Do you eat any of the following?

	md	1-2wk	2-3mth	Occ	Never	Afford
211. cream	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
212. creamy/Greek yoghurt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
213. plain/nat. yoghurt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
214. fruit yoghurt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
215. fruit corner	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
216. fromage frais	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
217. Other _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Do your child/ren ever eat....

	md	1-2wk	2-3mth	Occ	Never	Afford
218. cream	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
219. creamy/Greek yoghurt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
220. plain/nat. yoghurt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
221. fruit yoghurt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
222. fruit corner	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
223. fromage frais	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
224. Other _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

How often do you eat...

	md	1-2wk	2-3mth	Occ	Never	Afford
225. hard cheese (Cheddar)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
226. cheese slices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
227. cottage cheese	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
228. 'Dairylea' cheese	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
229. Brie/Camembert	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
230. Cream cheese (Phil.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
231. Eggs (as eggs)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
232. Eggs (baking)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
233. other _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

How often do your child/ren eat...

	md	1-2wk	2-3mth	Occ	Never	Afford
234.hard cheese(Cheddar)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
235.cheese slices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
236.cottage cheese	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
237.'Dairylea' cheese	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
238.Brie/Camembert	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
239.Cream cheese(Phil.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
240.Eggs(as eggs)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
241.Eggs(baking)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
242.other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

243. Are you a vegetarian? Yes ☐ No ☐

244. Are your child/ren vegetarian? Yes ☐ No ☐

245. Does the family have a roast dinner on a Sunday?Y☐ N☐

How often do you eat....

	md	1-2wk	2-3mth	Occ	Never	Afford
246. beef	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
247. mince	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
248. lamb	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
249. pork	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
250. bacon	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
251. ham/cooked meats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
252. chicken (duck etc;)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
253. tinned meat(Corn.beef	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
254. sausages(scotch egg)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
255. meat pies/past.(shop	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
256. liver/kidney/heart	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
257. burgers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
258. Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Do your child/ren eat....

	md	1-2wk	2-3mth	Occ	Never	Afford
259. beef	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
260. mince	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
261. lamb	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
262. pork	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
263. bacon	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
264. ham/cooked meats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
265. chicken (duck etc;)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
266. tinned meat(Corn.beef	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
267. sausages(scotch egg)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
268. meat pies/past.(shop	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
269. liver/kidney/heart	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
270. burgers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
271. Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Do you eat any of the following?

	md	1-2wk	2-3mth	Occ	Never	Afford
272. white fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
273. fish products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
274. oily fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
275. tinned tuna	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
276. smoked fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
277. shellfish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
278. Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Do your child/ren eat.....

	md	1-2wk	2-3mth	Occ	Never	Afford
279. white fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
280. fish products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
281. oily fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
282. tinned tuna	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
283. smoked fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
284. shellfish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
285. Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

How often do you and your children use sugar?

	md	1-2wk	2-3mth	Occ	Never	Afford
286. Parent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
287. Child/ren	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

288. How much sugar do you and your family use in a week?
(bag) _____

Do you eat any of the following?

	md	1-2wk	2-3mth	Occ	Never	Afford
289. Cake	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
290. Puddings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
291. Desserts (mousse/pot)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
292. Choc./filled bisc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
293. digestives/plain bis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
294. snack bars (Mars etc;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
295. crisps	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
296. sweets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
297. ice cream	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
298. jam & marmalade	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
299. honey	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
300. peanut butter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
301. Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Do your child/ren eat any of the following?

	md	1-2wk	2-3mth	Occ	Never	Afford
302. Cake	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
303. Puddings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
304. Desserts (mousse/pot)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
305. Choc./filled bisc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
306. digestives/plain bis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
307. snack bars (Mars etc;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

308. crisps	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
309. sweets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
310. ice cream	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
311. jam & marmalade	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
312. honey	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
313. peanut butter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
314. Other _____						

How often do you eat any of the following take-away foods?

	md	1-2wk	2-3mth	Occ	Never	Afford
--	----	-------	--------	-----	-------	--------

315. Fish & Chips	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
316. Kebabs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
317. Burgers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
318. Chinese	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
319. Indian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
320. Pizza	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
321. other _____						

Do your child/ren eat any of the following take-away foods?

	md	1-2wk	2-3mth	Occ	Never	Afford
--	----	-------	--------	-----	-------	--------

322. Fish & Chips	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
323. Kebabs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
324. Burgers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
325. Chinese	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
326. Indian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
327. Pizza	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
328. other _____						

Roughly how often do you drink the following?

	md	1-2wk	2-3mth	Occ	Never	Afford
--	----	-------	--------	-----	-------	--------

329. bottled water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
330. squashes (diluted)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
331. fruit juices F LL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
332. fizzy drinks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
333. hot choc./horlicks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
334. Other _____						

LL=longlife/UHT

Roughly how often do your child/ren drink the following?

	md	1-2wk	2-3mth	Occ	Never	Afford
--	----	-------	--------	-----	-------	--------

335. bottled water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
336. squashes (diluted)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
337. fruit juices F LL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
338. fizzy drinks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
339. hot choc./horlicks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
340. Other _____						

341. Do you take drinks containing alcohol? Yes|_| No|_|

	Most days	Wkend	Occ	Sp.Occ
Beer, stout, cider	_	_	_	_
Wine	_	_	_	_
Sherries	_	_	_	_
Spirits	_	_	_	_

How much would you drink at a time?

353. Do your children drink alcohol? Yes|_| No|_|

	Most days	Wkend	Occ	Sp.Occ
Beer, stout, cider	_	_	_	_
Wine	_	_	_	_
Sherries	_	_	_	_
Spirits	_	_	_	_

How much would they drink at a time?

THANK YOU VERY MUCH FOR ANSWERING ALL THESE QUESTIONS

LONG. TAPED (verbal prompts in brackets)

INTERVIEW SCHEDULE

"I'd like to ask you some questions about choosing and preparing food, about when and where you shop, and about how you manage the family budget. Let's begin with the kitchen...."

- 1a. What cooking facilities do you have?
- 1b. Do they work?
- 2a. What facilities do you have for storing food?
- 2b. Do they work?
- 3a. Do you have to share your cooking or storage facilities with anyone ?
- 3b. If yes, who? (*family, friends and other families*)
4. Do you think you have enough space to prepare and cook food?
- 5a. Are you happy with the facilities you have for cooking and storing food?
- 5b. If not, why not? (*can't afford to run the freezer*)
6. Do you enjoy cooking?
7. What sort of cooking do you usually do on weekdays?
8. What sort of cooking do you usually do at weekends ?
(*ready-meals, raw ingredients, assembly meal*)
- 9a. Do you ever heat up bought pies/ quiche/pizza etc;?
- 9b. Do you ever heat up complete ready-meals?
- 10a. Would you like to be able to cook more often ?
- 10b. If yes, what stops you from doing so?

11. How/ where did you learn to cook?

"Could I ask you about your family's meal patterns and shopping habits? " By family I mean you and your child/ren and anyone that eats with you.

12. Does the family eat most of their meals together?
(except for school lunch)

13a. Do you usually eat the same foods as the children?

13b. If not, why not?

14a. What do the child/ren do for lunch?

14b. Why do they do that?

15a. What do you do for lunch?

15b. Why do you do this?

16a. Do you or anyone in the family regularly buy take-away foods or sandwiches for lunch?

16b. If yes, can you say who, how often, and rough expenditure per week?

17a. Do you or anyone in the family regularly buy take-away foods or eat out for their evening meal or at weekends?

17b. If yes, can you say who, how often, and rough expenditure per week?

18a. Does anyone in the family have to eat a special diet recommended by the doctor?

18b. If yes, give details (include diabetes, coeliac disease)

18c. Is it easy to follow?

18d. Do you get financial help towards the cost of the diet?

18e. If yes, what sort of financial help (who from/how much)?

19. Who does most of the food shopping? (*alone*)

- 20a. Where are the heavy/stored food bought eg. tins, marg, bottles, flour, sugar? (*mega-store, corner shop*)
- 20b. How often are heavy/stored foods bought?
- 21a. Where are the everyday foods bought eg. milk, bread?
- 21b. How often are foods such as bread and milk bought?
- 22a. Where are things like fruit and vegetables bought?
- 22b. How often are fruit and vegetables bought?
- 23a. Where do you buy meat and fish?
- 23b. How often do you buy meat and fish?
24. Are the shops nearby?
25. How do you transport your food shopping home?
26. Why do you shop in these/this store(s)?
(*convenience, cheapest, can get credit*)
27. Could you tell me why you shop like this? (*frequency convenience, fits in with work, fits in with benefit*)
- 28a. Do you have a doorstep delivery / milkman?
- 28b. If so, what do you have delivered?
29. What do you look for when buying food?
(*likes, value for money, cost, healthy*)
30. What are the most important 'things' (aims) for you, when feeding your family?

"We'll come on to food costs and how you manage the family budget in a moment. I'd like to look first at food and health. Some people think the food you eat really does affect your health; others think it doesn't matter either way."

31a. What do you think?

31b. Can you explain what you mean?

32a. Do you actually try and eat certain foods or in certain ways because it's 'healthier'?

32b. If yes, what do you do?

33a. Do you try and encourage your child/ren to eat 'healthily'?

33b. If yes, how?

34a. Do you find you can actually feed your child/ren foods you want to?

34b. If not, why not?

35a. Do you read the information on foods/packages?

35b. If yes, what pieces of information do you read?
(*ingredients, nutrition, sell-by*)

36. What do you think about the information on foods?

37. Where do you get advice or hear about food and health?

"Some people think there is a lot of advice and information these days about 'healthy' eating'."

38a. What do you think about all the information?

38b. Who do you think it is aimed at?

38c. Do you think this advice is easy to follow?

38d. Do you try to follow the advice?

38e. If not, why not?

- 39a. Are you satisfied with the food you eat at the moment?
- 39b. If not, why not?
- 40a. Are you trying to control your weight at the moment?
- 40b. If yes, how? (*Weight Watchers past-present, weight conscious*)
- 41a. Are you happy with your child/rens weight/s?
- 41b. If not, what sorts of things are you trying to do about it?
- 42a. Are you taking any tablets or powders to supplement your diet at the moment? (*vitamins, minerals*)
- 42b. If yes, can you tell me what they are?
- 43a. Are you satisfied with the food your child/ren eat at the moment?
- 43b. If not, why not?
- 44a. Do you give your child/ren tablets or powders to supplement their diets?
- 44b. If yes, could you tell me what they are?

"I'd like to ask you about how you manage your **household budget**. There aren't any right or wrong answers here: I'm interested in what you do, how you manage. First, I'd like to get a clearer picture of your weekly income."

PROMPT CARD 1

- 45a. Could you go down this list and tell me which sources of income apply to you now? (*child's job, pension*)
- 45b. How much does each bring in per week (actually get, not entitlement and net of taxes etc:)

45c. (If currently receiving Income Support ask. Others skip to d.) You said you receive Income Support. Is the amount you get reduced because of any of the following and if so, by how much?

Read Out

- Electricity or gas bills
- Rent arrears
- Social Fund Loan
- Mortgage interest paid directly to DSS
- Earnings taken into account
- Other (Specify)

45d. So your weekly income is about £x? Do you pay rent/mortgage out of that? If yes, how much is that?

45e. So after paying for housing your weekly income is £y?

46a. Do you *work out a budget*? (*so much to spend on this and so much on that*)

46b. Do you manage to stick to what you have planned to?

46c. If not, why not?

PROMPT CARD 2

Here are some general 'things' people have to spend money on.

47a. Do all the things on the list apply to you?

47b. If not, which things don't apply?

48a. Is there anything missed out?

48b. If yes, what? (*insurance, bank loan, car, holiday, TV rental*)

49. I'm not going to ask you what you actually spend on things but, how do you organise the payments for the outgoings that apply to you?

50. Is there anything that is particularly difficult for you to pay?
- 51a. Do you keep money back / saved for any of these things?
- 51b. If yes, what?
52. When money is tight how do you manage to make ends meet?
What sorts of things do you do? (*juggle, borrow, credit, go without*)
- 53a. When you are short of money, what are the first things you cut back on?
- 53b. Why this/these things? (*going out, food, rent*)
54. Has lack of money ever been a problem in the past? If yes, how did you manage / What did you do? (*I didn't eat, casual job, partner*)
- 55a. Many people find the only way they can manage is to get a bit of extra work. Do you have a 'little' job which helps out financially?
- 55b. If yes, how much does that bring in at a time?
- 55c. What do you spend it on? (*general, particular*)
56. Roughly how much do you think you spend on food?
excluding toiletries, cigarettes, cleaning materials and household goods. Per week or month whichever is easier?
- 57a. (For smokers only.) Do you smoke?
- 57b. Roughly how much do you spend on cigarettes a week?
- 57c. Is that more or less than, say, this time last year?
- 58a. What about your child/ren, do they smoke?
- 58b. If yes, how much do they spend on cigarettes a week?
59. Roughly how much do you spend on alcohol a week?

- 60a. Do you think you spend much the same on food each week?
- 60b. Do you spend the same on food at Christmas and birthdays?
- 60c. Do you ever have to spend less on food because you are short of money?
- 61a. Do you ever have to change what food you buy because you are short of money?
- 61b. If yes, what do you do? (*cheaper brands, less food*)
- 62a. When you are economizing, are there any particular foods you don't buy or you buy less often?
- 62b. If yes, which foods? (*childrens sweets, drinks, or crisps*)
- 63a. If you had more money what foods would you like to buy more often?
- 63b. Would you really buy these foods if money wasn't a consideration or is there anything else that would stop you from doing so? (*family prefs, skill, time*)
- 64a. Can you afford to eat as much fresh food as you would like?
- 64b. Can you afford to give your child/ren as much fresh food as you'd like?
- 65a. A lot of people have times when they have to make a meal with just the food in the store cupboard (tins, packets) or left in the freezer. Do you have to do that?
- 65b. Why does that happen?
- 65c. How often?
- 65d. Is that for the child/ren's meals as well?

- 66a. Do you ever skip a meal or cut down on the amount you eat?
- 66b. If yes, why? (*too tired, weight, no money*)
- 66c. How often?
- 67a. Are you ever hungry, but don't eat because you can't afford to cook something or eat what you want?
- 67b. If yes, when?
- 67c. How often?
- 68a. Do you ever reduce the size of your childrens meals, or do they ever skip meals?
- 68b. If yes, why?
- 68c. How often?
- 69a. Do you ever run out of money for food?
- 69b. If yes, how often does this happen?
- 69c. What happens then, how do you manage? (*credit, friends, family*)
- 70a. Do you ever get credit from shops to buy foods?
- 70b. Do you ever buy food using a credit card?
71. Do you worry about running out of money for food?
72. Do you belong to any local community groups, a church or organisations for lone parents (Gingerbread)?
- 73a. Do you see any relatives or friends regularly?
- 73b. If yes, who?

- 74a. Do you have a friend/family who you can talk to/share problems with?
- 74b. Do they help you financially? (*pay bills*) How often?
(what do they do?)
- 74c. What do they do/how do they help?
- 75a. Do you have anyone relatives/*friends* who help with looking after the child/ren?
- 75b. If yes, do they do this while you were at work?
- 76a. How often do you have visitors who stay for meals with the family?
- 76b. Who tends to visit you most?
- 77. Do your child/ren have their friends to stay for meals?
- 78a. Do you and your children have meals with other families or friends?
- 78b. If yes, who?
- 79a. Do you think you are more stressed now being a lone parent than you were before?
- 79b. If you do feel stressed what do you do to try and relieve it?
- 80. Could you tell me how much contact the father/mother has with the children and yourself? (*Go away for weekends, holidays. Frequency*)

We've covered quite a lot of ground in this discussion. I'd like to ask you as a final question "

- 81. If you had to choose three things that would make it easier for you to feed yourself and your child(ren) as you want, what would they be?

Food Stamps

" Thank you very much for taking part. Is there anything else you'd like to say?

COULD YOU GO DOWN THIS LIST AND TELL ME WHICH
SOURCES OF INCOME APPLY TO YOU NOW.

CHILD BENEFIT

LONE PARENT BENEFIT

INCOME SUPPORT

FAMILY CREDIT

OTHER BENEFITS

REGULAR JOB

OCCASIONAL JOB

MONEY FROM FORMER PARTNER

TRAINING ALLOWANCES

EDUCATION GRANT/BURSARY

INTEREST (Savings/investment)

RENT FROM PROPERTY/SUBLETTING

OTHER REGULAR SOURCE OF INCOME

LONG

INTERVIEW:

INCOME

PROMPT

CARD

(ask for
amounts
for each)

LONG INTERVIEW: EXPENDITURE PROMPT

things people have to spend money on:

housing

Social Fund loan

clothes

fuel bills

telephone bill

Poll tax

going out
(self)

household goods
(cleaning)

going out
(child/ren)

pets

cigarettes

water rate

debts

child-care

travel to work

food

child's party

Christmas

APPENDIX 2

DATA ENTRY AND ANALYSIS PROCEDURES

This appendix gives details of checking and data entry procedures used for dietary and food frequency data; analysis procedures; and methods used for cluster analysis of food choice.

Dietary data entry

As each logbook was collected common ambiguities were clarified: respondents were asked about missing meals, unrecorded ingredient or portion weights, whether foods had been tinned, fresh, frozen, and preparation or cooking details (eg whether milk and margarine were added to mashed potatoes).

Dietary records of six children who were totally or partially breastfed were omitted. Records were not entered if ^{the logbook} contained few weights, ^fweights or detailed household measures were missing for a main meal, where it was unclear who had eaten what, or if the logbook was illegible. Sometimes the whole logbook (records of all individuals in a household) was rejected; sometimes individual records within a logbook were rejected. A particular problem occurred in some larger black households where big soups or stews, prepared for all household members, had lasted beyond the dietary survey period. However meticulous the dietary record keeping (and it often was), proportions of ingredients consumed by different individuals could not then be calculated, and these logbooks had also to be rejected because they could not give a sufficiently accurate record of what each person had eaten.

Dietary data were entered into COMP-EAT 4 (Lifeline, undated) directly from the logbooks. Published standard portion sizes (Crawley, 1988) were used for occasional missing weights, with quantities eaten for the remaining parts of the record used to gauge whether the individual ate small, medium or large portions. Weights were often missing for school lunches eaten by younger children. Standardized portion weights were devised according to age using data on school meal portion sizes (M. Nelson, 1993, unpublished data) and various portion sizes in Crawley (1988). Weights of estimated portions for school meals were chosen to be comparable to recorded weights for similar meals the individual had consumed at home.

COMP-EAT 4 has a fairly extensive database of nutrient content of contemporary foods, but new products, especially "own brand" versions, are constantly appearing, particularly fat spreads and "diet" versions of products. Food retailers and manufacturers were contacted for latest analyses of their own brand products and these were added to the COMP-EAT 4 database. Alternatively products were sometimes purchased and the ingredients' list and nutrition information used as a basis for selecting a food similar in energy and other main nutrients from the COMP-EAT 4 database; alternatively "new" composite dishes were constructed and added to the database. There is some evidence the food composition database is less reliable for

the nutrient content of poorer quality (cheaper) meat, and also that it is less likely to contain nutrients of cheaper brands of food (C. Williams, personal communication). These issues were taken into account in choice of nutrients to use for foods wherever possible. A procedure was devised for accurate calculation of water losses on cooking and reheating in home-cooked recipes where the final cooked weight of the dish had not been given¹.

Manufacturers' information was especially important for baby foods, where vitamin or mineral fortification is not standardized across products. In addition, Milupa, manufacturers of a dehydrated baby food, supplied a detailed nutrient analysis of their products as purchased dehydrated, with reconstitution instructions ('x'g powder added to 'y'g water; nutrients given per 'x'g powder). These were used to calculate nutrient intakes, but in truth there was no way of knowing whether respondents had correctly reconstituted the powders because weights in the logbook were usually of food as fed.

Dietary data checking and preparation for analysis

Data for each on each individual were transferred to SPSS via a program² written in dBase (Jones, 1990). Data cleaning and analysis was done in SPSS. Distributions and ranges of nutrient intakes were checked; records of those who appeared to have very high or very low intakes of nutrients were examined and any errors corrected³. Mean nutrient intakes and %DRVs were calculated for each individual in SPSS.

The RNI was used for the majority of nutrients in analysis (DH, 1991). For non-starch polysaccharides (NSP) COMA's proposed "population average" was used as being sufficient for good health in adults; no requirement figure was used for children. For vitamin E the COMA proposal for "safe intake" of 4mg/day for males above 2 yrs and 3mg/day for females above 2 years, and 0.4mg per gram of dietary Polyunsaturated Fatty Acids for infants under 2 years was used. The "safe intake" is sufficient to meet the needs of most people. "% DRV" is used in the text for all these values.

¹ 1) The energy content of each ingredient was calculated. 2) A new "weight" was calculated for each ingredient on the basis of energy content when cooked, and the total "weight" of the cooked dish calculated. 3) The proportion of recipe eaten by each person was calculated, using the total "weight" of cooked dish and the individual's serving size from the logbook. 4) The proportion of total recipe each individual consumed was applied to each raw "weight" from step 2, and, with the exception of vegetables, the "weight" of food as raw was entered. For vegetables such as carrots, high in simple sugars so leaching energy as well as water soluble vitamins during cooking, the calculated "weight" for the food as cooked was used.

²The program was written in autumn 1993 by Ian Shepherd (Norwich) in whom copyright resides. Members of the Human Nutrition Unit, London School of Hygiene and Tropical Medicine are permitted to use the program for work in the Unit.

³Unfortunately, no checks were run on distributions of %DRVs, which meant a COMP-EAT 4 program fault was missed early on. Subsequently, the fault, whereby intakes of vitamin A [and possibly other nutrients] that exceeded 1000%DRV were coded as an error and therefore 0, was discovered during analysis, when the minimum for %DRV vitamin A in children over 11 years was observed to be 0. When the individual's record was checked, the actual entry was found to be correct: the child had eaten liver, which has a very high vitamin A content, and thus exceeded 1000%DRV. Lifeline Inc supplied a correction to COMP-EAT 4 to prevent the occurrence.

If an individual's intake of vitamins, (such as vitamin C, or minerals, such as iron) is below the LRNI there is a 97% chance the individual is at nutritional risk. The dietary survey was a three day weighed intake and therefore reasonably precise (the less precise the measurement of dietary intake, the more likely there are to be individuals identified as having very low intakes). Individuals whose nutrient intakes were below the LRNI for vitamins or minerals were identified, and are described in the text as being at very high risk of inadequate nutrient intakes.

Basal Metabolic Rate (BMR) for each individual was calculated from recorded body weight (most parents and some children) or population averages for age and gender, using both Schofield (1985) and WHO (1985) equations. Each individual's 3-day mean energy intake was compared with their BMR x 1.2 (Goldberg et al, 1991), and the dietary records, food frequency and interview data of individuals whose mean was below 1.2 x BMR (i.e. they were "low energy reporters" (Pryer et al, 1994) were re-examined for general reliability, whether snacks and drinks were recorded, or whether the person had been ill and not eating. Three individuals' records which seemed to have foods missing or under-recorded were dropped. There was no relationship between BMI and "low-energy" reporting: the "low-energy" consumers were not more likely to be either obese or underweight.

There were few demographic or economic differences between those who completed a usable dietary record and those who did not. The exceptions, which were only between those who kept a usable record, and those whose records were rejected (rather than those who kept no record at all) were ethnicity and adjusted weekly household income (£93 for those whose logbooks were used, £73 for those whose were not). Dietary information was less likely to be obtained from poorer households, some of whom were also black households.

Natural logarithm of vitamins A, C and E, and iron/1,000 kcals were used to correct for non-normality. Where intakes of these nutrients are presented in the text, they are the geometric rather than the arithmetic mean (the antilog of the log mean). Dietary data were available for 126 women and 5 men; 108 girls and 88 boys. Percentage of reference values for eight nutrients, NSP and energy, and actual fat intakes were used as dependent variables in ANOVA for parents and children separately. Where data were obtained on more than one child in a household the mean %DRV for those children was used, so that household variables could be used in ANOVA. Averaging children's nutrient intake adequacies for households reduced the numbers of children's cases (from 196 to 125) and reduced the effect of any intra-household variation in adequacy. Averaging might have decreased the likelihood of detecting differences between groups that were significant. However, a second consequence of averaging intake adequacies is that those differences detected must in practice be quite large, or must occur in all the children in a household.

Food frequency data: construction of indicators

The questionnaire is shown in appendix 1; answers were recorded in the simple check-boxes. Data were double-entered and validated using Epi-Info v5.01b (Dean et al,

1990) and analysed using both Epi-Info v5.01b and SPSS/PC+ v4.1 (Norusis, 1990). Frequency weightings were assigned to the FFQ frequency categories much as Wheeler and colleagues (1989) had done: an estimated number of days a food item would be consumed in a month, with adjustment to close-to-linear weighting to minimize the effect of respondent misclassification of frequency. The weightings used were as follows (Wheeler et al, 1989 are given in brackets):

Most Days	18 (20)
1-2 week	12 (9)
2-3 month	6 (3)
Occasionally	1 (1)
Never	0 (0)

A simple measure, combining variety and frequency, was calculated using the formula:

$$VFS = \frac{\sum_{i=1}^S W_i}{S}$$

where w_i is the weight associated with the frequency category recorded for each food item (i) and S is the total number of food items listed on the FFQ (Myatt and Dowler, unpublished mimeo, 1995). The variety frequency score (VFS) is thus a measure of both diversity and abundance or variety and frequency. High variety-frequency is associated with more foods eaten more often and low variety-frequency with few foods eaten often or more foods eaten seldom. The behaviour of the VFS was examined using a simulation program which generated uniform random distributions of the frequency categories for ten food items. Three hundred runs of the simulation program showed the VFS gave an reasonable and consistent summary of dietary diversity and abundance, and the formula was applied to the real data. Minor departures from normality in the distributions of VFS for overall food variety, vegetables, fruit, fish, and cereals were corrected by log transformation.

Adult and child VFSs were found to be correlated with each other (range of correlation coefficients was 0.6-0.8). Some of this effect may have been due to the adult head of household answering for themselves and their children. Conversely, lone parents tend to be poor and therefore less able to provide alternative meals for their dependent children. Such convergence in patterns of food consumption was expected and is consistent with the literature (Mack & Lansley, 1985; Graham, 1993).

Three validation checks were applied to the VFS.

First, the VFS for fruit and vegetables were correlated with intakes of vitamin C, folate and NSP in the same households; the correlations were weak but statistically significant (0.3-0.4).

Second, the FFQ data were themselves used to estimate nutrient intakes using average portion sizes (Crawley, 1988) and McCance and Widdowson's The Composition of Foods (Paul and Southgate, 1978). These estimated nutrient intakes were compared with the actual measured intakes. Correlations were significant but weak (0.14 and 0.55), not least because the FFQ was not designed to measure intake. However, these correlations are in line with other researchers' results (Nelson, 1991).

Third, Dietary diversity was crudely estimated by counting the mean daily number of different food items listed in the logbook for the 131 adults who had completed a weighed intake record. This estimate was compared with the adults' VFS for overall food variety. Correlation was significant but weak (0.32).

These validation checks were sufficiently encouraging to permit using the VFS as dependent variables for analysis by ANOVA.

Healthy dietary patterns: fruit and vegetable indicator

Answers given in the FFQ to the 59 questions about fruits and vegetables were used to construct a simple indicator of the likelihood parents and children were eating 5 or more fruits and vegetables a day. Frequency responses of "most days" were weighted as 0.5, "once or twice a week" as 0.145 and all other responses as "0". (Thus a person who said they ate an apple every day would have a 0.5 probability of eating an apple every day - they probably eat one every other day; someone who said they ate a banana once or twice a week would have a 0.145 probability of eating a banana - they probably eat one once a week.) These are conservative weightings to counteract any exaggeration or respondent frequency misclassification. The weighted responses were summed and grouped as "below 2.5", "2.5 - below 5" and "5 and over", to produce a fruit-vegetable indicator for parents and children. These categories were validated against nutrient consumption for parents, and proved reasonably reliable.

table 1 parents' nutrient intake adequacy and the fruit and vegetable index.

nutrient (se)	<2.5 fruit or veg/day n=40	2.5-<5 fruit or veg/day n=45	5+ fruit or veg/day n=43	p value ANOVA
nsp g	9.3 (0.60)	10.6 (0.74)	11.2 (0.68)	ns
zinc %RNI	100 (5.3)	108 (6.1)	124 (6.9)	0.026
folate %RNI	83 (6.0)	102 (6.1)	104 (7.2)	0.049
vitamin C %RNI	74	134	142	0.0018

Analysis procedures

ONEWAY and ANOVA procedures (using regression approach, whereby all effects are assessed simultaneously, with each effect adjusted for all other effects in the model) were used, with testing for homogeneity of variance for key independent variables. Simple regression, multiple regression and Yates corrected Chi-Square were also used for normally distributed data, and non-parametric tests Mann-Whitney and Kruskal-Wallis for data which were not normally distributed (such as income).

ANOVA was used to investigate associations between the nutrient, variety and healthy diet indices as dependent variables, and independent variables in groups as in figure

1.1, chapter 1, namely: household socio-economic and demographic characteristics; patterns of budgeting and food management; shopping, cooking and eating patterns; and health beliefs, and individual characteristics such as age. Nutrient data were also analyzed using multiple regression, with parents' nutrient intakes, and dependent children's nutrient intakes as outcome variables. For children the child's age was included to correct for the effects of different body size and composition, gender, and a regression weighting used to account for household composition. These analyses support the findings using ANOVA⁴, and are not presented in the thesis.

Cluster analysis

Responses to two questions about dietary aspiration in the long interview were subsequently analyzed using cluster analysis, to investigate the presence and nature of patterns in the responses, if any. Cluster analysis is a generic term used to describe classification techniques which look empirically for the presence of groups of cases or individuals, where members of each group are as similar or like each other as possible in terms of some specified characteristics, and as unlike members of other groups. Cluster analysis does not require the investigator to specify in advance the basis of group membership, nor the number of groups. The techniques can therefore be used to search for natural groupings in a data set. Cluster analysis is a "structure imposing" strategy in operation and the user is left to her or his best judgement on the appropriate methods and number of clusters (Everitt, 1980; Adenderfer and Blashfield, 1984).

Clustering was based on responses to the two open-ended questions during the taped long interview: "When you are buying food, what are you looking for?" and "What are your main aims in feeding your family?". Sets of binary variables created from the answers given were used (1 = "yes"; 2 = "no"), and all answers previously coded as "other" were recoded from the post-coding sheets (where they had been written out by hand). This extra coding gave 11 variables of food choice, and eight variables of food aims; these variables are shown in the figure. There were very few missing values. Clustering was done for food choice and food aim variables separately, and for the two combined.

SPSSPC provides facilities for agglomerative hierarchical clustering (where cases are grouped progressively into bigger and bigger clusters until all are in one group; hierarchical techniques are non-iterative and so can be run using PC based statistical packages), and a choice of methods for combining clusters. The "average linkage between groups" method (the SPSS default) and Ward's method based on squared Euclidian distances were used, following statistical advice (A. Draper, J. Pryer, P. England, personal communication) and the literature (Adenderfer and Blashfield, 1984,

⁴For instance, using standard multiple regression (where all effects are entered simultaneously) on children's nutrient adequacy, the *material poverty index* contributed significantly to lower adequacy of iron, vitamin C and vitamin A when entered with age, although the effect was much less powerful than that observed on parents' nutrient adequacy. When "looking for fresh food" and ethnicity were also included, the contribution disappeared.

remark that average linkage methods had been used in the biological sciences, and Ward's method in the social sciences; Everitt, 1980 also discusses the choices and their implications). Clustering based on the "food choice" variables was done using "average linkage between groups" method; that for "food aim" variables was done using Ward's method (the alternative "average linkage between groups" method assigned 95% of cases to one group).

figure 1 Variables used for cluster analysis on "food choice" and "food aims"

(variables are not listed in any particular order)

Food choice variables:

"When you are buying food,
what are you looking for?"

fresh food/freshness
quality
special offers
food that's cheap
healthy food
what the kids will eat
what I like to eat
value for money
what I usually buy
what I/we fancy/something appetizing
the best I can afford

Food aim variables:

"What are your main aims in feeding your
family?"

family future healthy/kids grow well
kids learn to enjoy food
provide a varied diet
provide balanced/nutritious diet
provide healthy food
provide kids a good diet
not to be hungry/provide enough
keep family happy so stay and eat

The correlation matrix of variables (shown in appendix 6) was also analyzed using factor analysis (which is based on a more systematic theoretical model than cluster analysis), using varimax and equimax rotation methods.

APPENDIX 3

ADJUSTMENT FOR HOUSEHOLD SIZE AND COMPOSITION

Equivalising household income:

Data on full-time and part-time earnings, social security benefits and all other sources of income for the whole household unit were collected. These were summed to give an estimate of **net income**: that is, net of income tax, of national insurance and pension contributions, and of housing benefit and any allowances. Respondents were also asked about housing costs and an estimate of **income after housing** was calculated. In practice, the estimates of housing costs, particularly for owner occupiers, were not reliable, and calculated income after housing figures were not used for analyses presented in this thesis.

To be able to compare households of different size and composition, a measure of **equivalent net income** was created: the net income figure for the household was adjusted to take account of the number and age of dependents. The McClements equivalence scale for net income was used, as by Bradshaw and Millar (1991) and the DSS (Social Trends, 1995):

Lone parent	= 0.61
spouse/partner	= 0.39
other adult (2nd)	= 0.46
other adult (3rd)	= 0.42
child aged 16-17	= 0.36
13-15	= 0.27
11-12	= 0.25
8-10	= 0.23
5- 7	= 0.21
2- 4	= 0.18
0- 1	= 0.09

A total equivalence value was calculated for each household by summing the appropriate scale values for each household member. **Equivalized household income net of housing costs** was calculated by dividing household income by the household's total equivalence value.

Because there is uncertainty about the most appropriate set of equivalence ratios to use for lone parent, as opposed to two parent households (Whiteford 1987; Binh and Whiteford, 1990; P. Whiteford, personal communication), sensitivity analyses were done using different equivalence ratios. The skewedness of the income distributions increased, and none of the other equivalence ratios gave any better discrimination in nutrients than the McClements scale, so the McClements scale was used for the analyses presented in this thesis.

Equivalising the amount spent on food:

Respondents' estimates of the amount of money spent on food each week were also corrected for household size and composition. Food equivalizing ratios similar in principle to the income equivalizing ratios were constructed, based on energy requirements of an adult male (ie. Consumption Units, as described in Wheeler, 1991; requirements from COMA in Department of Health, 1991):

Adult male	= 1.00	Adult female	= 0.76
Boy aged 15-18	= 1.08	Girl aged 15-18	= 0.83
11-14	= 0.87	11-14	= 0.72
7-10	= 0.77	7-10	= 0.68
4- 6	= 0.70	4- 6	= 0.61
1- 3	= 0.48	1- 3	= 0.46
0- 1	= 0.29	0- 1	= 0.27

Thus the **amount spent on food per household, adjusted for household size and composition** was obtained. This figure was calculated from estimates, rather than expenditure records, and is less accurate than food expenditure data given, for instance, in the National Food Survey.

APPENDIX 4

LONE PARENT: BODY MASS INDEX DATA

table 1 BMI of female parents

<i>BMI category Kg/m²</i>	<i>n in sample</i>	<i>mean BMI</i>	<i>se</i>
≤ 20	19	18.8	0.23
over 20 ≤ 25	65	22.2	0.16
over 25 ≤ 30	44	27.0	0.17
>30	26	34.3	0.80

table 2 female parent BMI and various socio-demographic indicators

<i>indicator</i>	<i>n</i>	<i>BMI</i>	<i>se</i>	<i>n</i>	<i>BMI</i>	<i>se</i>	<i>n</i>	<i>BMI</i>	<i>se</i>
<i>Income Support</i>	yes=107	24.8	0.51	no=47	26.0	0.78			
<i>social class</i>	mn=106	25.1	0.51	nm=41	25.3	0.80			
<i>qualifications</i>	none 69	25.6	0.63	sec=39	24.1	0.76	tert=46	25.4	0.85
<i>pov index</i>	2=31	25.7	1.13	1=45	23.8	0.61	0=66	25.9	0.69
<i>ethnicity 3 groups</i>	af=15	25.9	0.94	blbr=35	26.1	0.92	wh=97	24.9	0.57
<i>ethnicity 2 groups</i>	bl=50	26.0	0.70	wh=97	24.9	0.57			
<i>dietary data OK</i>	yes=122	24.8	0.48	no=32	26.5	0.95			
<i>age yrs</i>	$<35=70$	24.1	0.60	$35+=84$	26.0	0.59*			

* $p = 0.026$

table 3 female parents: age in yrs/quartiles and BMI

<25 yrs	n=12	BMI 23.3	se 1.43
25-34yrs	n=58	BMI 24.3	se 0.66
35-44yrs	n=54	BMI 26.0	se 0.79
≥ 45 yrs	n=30	BMI 26.1	se 0.85

With the exception of age <35 yrs, none of the relationships shown was significant

APPENDIX 5

ANOVA RESULTS FOR ADEQUACY IRON, NSP, FOLATE AND VITAMIN C INTAKES, VARIETY FREQUENCY SCORES, HEALTHY DIETARY SCORES

This appendix shows the results of ONEWAY and multi-way ANOVA for adequacy of iron, folate and vitamin C and NSP intakes; and for the variety frequency scores and healthy diet scores. It contains the data which support the summary box figures in chapter 5.

Analysis of variance tests the hypothesis that the mean values of the dependent variables, such as % DRV for iron, or parent VFS for fruit, are the same in all groups of the independent variables (e.g. between smokers and non-smokers; between those who are not poor by the *material poverty index*, and those who are; between those who are white Europeans, black british/ Caribbean/ African; etc). The observed significance level shows the likelihood that this is the case; where the value is small enough ($p < 0.05$), the hypothesis that the mean values are the same is rejected.

The analyses proceeded thus: all independent variables were tested against the 3 nutrient adequacy indicators, mean NSP intakes in g, all the VFS and HDS as dependent variables using ONEWAY ANOVA. These results are shown first for all dependent variables, listing only those independent variables where the "p" value was less than 0.05. The independent variables are grouped under broad headings comparable to the factors shown in figure 1.1. Two examples of ANOVA procedures are also shown to illustrate the differences obtained between group means in the dependent variables. Differences between group means for the nutrients are shown for the independent variables age, ethnicity, receipt of Income Support, the *material poverty index* and smoking in tables in the text of chapter 5. Group means for the remaining independent variables are not given in this appendix in the interests of space and brevity; they are sometimes presented in the text of chapter 5 to support the argument.

No meaning could be attached to the absolute values of the VFS or HDS: the assumption was simply that higher values were more likely to lead to healthier outcomes than lower; the analyses were essentially ranking procedures. Therefore no actual VFS or HDS values are shown, other than that in the example page.

Multi-way ANOVA results are presented next. The multi-way procedures were run with independent variables in the groups shown. For the nutrients, few of the relationships remained significant; those that were are shown. For the VFS and HDS many more independent variables remained significantly associated with higher or lower values of the dependent variables, when run in groups. Finally, for the VFS and HDS the independent variables which remained significant from the group multi-ways were run together in one final multi-way. For analyses using both nutrient adequacy indicators and the VFS/HDS, the *material poverty index* was constructed subsequently,

and the final multi-ways re-run using that in place of "social class" and "qualifications", and in place of "keystamp", since the latter was absorbed into the index, and the former are broad indicators, much of whose meaning is subsumed by the other independent variables. These results are presented in the final figures for each set of indicators.

The figures presented in chapter 5 draw on all these sets of data. The nutrient figures (5.2 and 5.3) were constructed subjectively from the strength and independence of the associations between the independent variables and the nutrient adequacy indicators. For the VFS and HDS, the results of the final multi-way are presented first, under the heading "*most important*"; the results of the grouped multi-ways are presented second, under the heading "*also important*"; the results of the ONEWAY analyses are presented third, under the heading "*less important*" (see note to figure 5.6). The independent variables for vegetable and fruit VFS were combined for both parents and children to simplify the presentations.

Glossary of variable names:

dependent variables:

iron % DRV	mean % of Dietary Reference Value achieved for iron
NSP	non-starch polysaccharide
folate % DRV	mean % of Dietary Reference Value achieved for folate
vit C % DRV	mean % of Dietary Reference Value achieved for vitamin C
a_abs/c_abs	adult/child absolute (overall) food VFS
a_fish/c_fish	adult/child fish variety
a_meatp/c_meatp	proportion adult/child meat variety from meat products
a_veg/c_veg	adult/child vegetable VFS
a_fruit/c_fruit	adult/child fruit VFS
a_cereal/c_cereal	adult/child cereal variety
a_hdiet/c_hdiet	adult/child HDS

independent variables:

demographic:

age	parent's age in quartiles
agegp	age group youngest child <5/5-9/10-15/>15
agegp2	age group youngest child <10/10+
ethresp	parent's ethnicity black/white
famcirc2	parent+dep children only/ other
fsize	number living under same roof 1-3/4+

socio-economic:

qualif	secondary/tertiary/professional qualifications
sclass/	occupational social class manual:nonmanual
occupcat	

is	Income Support yes/no
owncar	car owner/access yes/no
houseown	owner yes/no
laharent	rent from local authority or housing association yes/no
rappincgp	reciprocal of total household weekly income in quartiles
requincgp	reciprocal of equivalized total weekly income in quartiles
leqfdgp	log equivalized amount spent on food in quartiles
percfd1	% approx total income spent on food <25/25-50/>50
percfd2	% approx income after housing spent on food <25/25-50/>50
employed	paid employment yes/no

budgeting:

dd	any bill paid by direct debit yes/no
keystamp	any bill paid by key meter or stamp purchase yes/no
tied	any money off benefits directly or pay by key meter yes/no
control	any bills paid by stamps or saving money regularly yes no
paybill	any bill paid whenever it comes yes/no
catalog	household goods bought from catalogue yes/no
planbudg	those who planned their budget spending in advance yes/no
skipmon	skip meals because not enough money for food yes/no
runout	run out of money to buy food needed yes/no
affordu	feel can afford enough fresh food for self yes/no
affordch	feel can afford enough fresh food for children yes/no

shopping:

whereday	where bread/milk bought discount only/combination
whheavy	where main food shopping bought discount only/combination
whfrtveg	where fruit and vegetables bought discount only/combination
wmeatfis	where meat and fish bought combination/discount/specialist/market
freqhevy	how often heavy goods bought ad-hoc or weekly/in bulk

cooking and eating:

likecook	enjoy cooking yes/no
wkcook	cooking during weekdays raw ingredients/snacks or "assembly" meals
satcook	cooking on saturdays raw ingredients/snacks or "assembly" meals
heatcook	using bought pies occasionally to add meal variety yes/no
mealtog	family eats meals together (other than weekday lunch) yes/no
eatsame	parents eat same food as children yes/no
tae1oft	take-away foods (evenings) eaten weekly/occasionally

food aims: (answers to "when buying food, what looking for?"/"aims in feeding family?")

aimvar	variety yes/no
healthy	healthy food yes/no
vfm	value for money yes/no
cheap	food that is cheap yes/no
ilike	I buy what I like to eat yes/no
childeat	I buy what the children will eat yes/no
fresh	food that is fresh yes/no

- in the main, yes = higher nutrient adequacy/VFS/HDS
no = lower nutrient adequacy/VFS/HDS

NB: is, laharent, catalog, keystamp, tied, control, runout, skipmon, cheap, ilike,
 childeat: yes=lower; no=higher
 whheavy, whereday: combination=higher; discount=lower
 wmeatfis: specialist=highest; combination/market = higher; discount=lower
 age: older parents=higher; younger parents=lower
 agegp: (for parents) youngest children <10yrs=lower; >10yrs=higher
 (for children) youngest children <10yrs=higher; >10yrs=lower
 wkcook, satcook: raw ingreds=higher; snack=lower

NUTRIENT INTAKE ADEQUACY

table 1: ONEWAY ANOVA - demographic variables and adequacy of iron, NSP, folate and vitamin C intakes: parents and children

<i>parents</i>	<i>age</i>	<i>agegp2</i>	<i>ethresp</i>
iron	p=0.0158	p=0.0029	p=0.0041
NSP		p=0.0113	p=0.0323
folate		p=0.0002	
vitamin C		p=0.0001	p=0.0083
<i>children</i>			
iron	p=0.0156	p=0.0014	
NSP	p=0.0011	p=0.0005	
folate	p=0.0049	p=0.0013	
vitamin C			p=0.0219

table 2: **ONEWAY ANOVA - socio-economic variables and adequacy of iron, NSP, folate and vitamin C intakes: parents and children**

<i>parents</i>	<i>qualif</i>	<i>occupcat</i>	<i>houseown</i>	<i>owncar</i>	<i>rappingcp</i>	<i>reqincgp</i>	<i>leqfdgp</i>	<i>employed</i>	<i>laharent</i>
iron			p=0.0001	p=0.0006	p=0.0139	p=0.0004	p=0.0002	p=0.0014	p=0.0002
NSP	0.0263	p=0.0078	p=0.0057	p=0.021		p=0.0026		p=0.0022	p=0.0046
folate	p=0.043	(p=0.067)	p=0.0012	p=0.0003	(p=0.06)	p=0.0264	p=0.0342	p=0.0078	p=0.0008
vitamin C	p=0.044	p=0.0250	p=0.0054	p=0.0403	(p=0.07)	p=0.0155		p=0.0011	p=0.0143
<i>children</i>									
iron					p=0.0213				
NSP		0.0105			p=0.0225			p=0.042	
folate					p=0.0128				
vitamin C	p=0.0059								p=0.0149

table 3: ONEWAY ANOVA - budgeting and shopping variables and adequacy of iron, NSP, folate and vitamin C intakes: parents and children

<i>parents</i>	<i>skipmon</i>	<i>catalog</i>	<i>(keystamp)</i>	<i>control</i>	<i>tied</i>	<i>runout</i>	<i>affordu</i>	<i>affordch</i>	<i>whheavy</i>
iron		p=0.0021	p=0.0000	p=0.0028	p=0.0000	p=0.0001	(p=0.069)	p=0.0291	p=0.0038
NSP	p=0.0051	p=0.0017	p=0.0004	(p=0.073)	p=0.0000	p=0.0029	p=0.0026	p=0.0040	p=0.0041
folate	p=0.0038	p=0.0041	p=0.0152		p=0.0004	p=0.0015	p=0.0002	p=0.0003	p=0.0057
vitamin C		p=0.0003	p=0.0507		p=0.0086	p=0.0030	p=0.0001	p=0.0000	p=0.0001
<i>children</i>									
iron	p=0.0156								
NSP									
folate									
vitamin C									
	p=0.0013 p=0.0191								

**table 4: ONEWAY ANOVA - cooking, eating and food choice/aim
variables and adequacy of iron, NSP, folate and vitamin C
intakes: parents and children**

<i>parents</i>	<i>ilike</i>	<i>childeat</i>	<i>fresh</i>	<i>healthy</i>
iron			p=0.0427	p=0.0053
NSP	p=0.0359	p=0.0064	(p=0.062)	p=0.0054
folate				
vitamin C			(p=0.057)	
<i>children</i>				
iron				
NSP				
folate			p=0.0082	p=0.0264
vitamin C			p=0.0048	

EXAMPLE : PARENTS

- - - - - O N E W A Y - - - - -

Variable PEFOLATE parent folate % DRV
By Variable AFFORDU U afford amount fresh food want?

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	25155.7719	25155.7719	15.0918	.0002
Within Groups	110	183353.7035	1666.8518		
Total	111	208509.4754			

Group	Count	Mean	Standard Deviation	Standard Error	95 Pct Conf Int for Mean
yes	55	111.6106	47.6107	6.4198	98.7396 To 124.4816
no/some-times not	57	81.6322	32.9902	4.3697	72.8787 To 90.3856
Total	112	96.3537	43.3412	4.0954	88.2385 To 104.4690

Group	Minimum	Maximum
yes	50.5000	226.5000
no/some-times not	16.7500	178.3333
Total	16.7500	226.5000

Page 729

SPSS/PC+

2/9/96

This procedure was completed at 19:11:52

EXAMPLE : CHILDREN

----- O N E W A Y -----
 Variable HHFOLPER mean household folate adequacy dependent children
 By Variable FRESH look for [in] food: freshness

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	52697.6402	52697.6402	7.2221	.0082
Within Groups	120	875612.0995	7296.7675		
Total	121	928309.7397			

Group	Count	Mean	Standard Deviation	Standard Error	95 Pct Conf Int	for Mean
yes	43	189.0710	117.3719	17.8990	152.9493	To
225.1928						
no	79	145.5672	61.7079	6.9427	131.7454	To
159.3890						
Total	122	160.9005	87.5898	7.9300	145.2009	To
176.6001						

Group	Minimum	Maximum
yes	39.1667	766.6667
no	42.0000	339.1667
Total	39.1667	766.6667

table 5: Muti-way ANOVA - summary variables and adequacy of iron, NSP, folate and vitamin C intakes: parents and children

	<i>iron % DRV</i>	<i>NSP</i>	<i>folate % DRV</i>	<i>vitamin C % DRV</i>
poverty4	p=0.007	p=0.031	p=0.005	
ethresp	p=0.015			p=0.001
whheavy	p=0.031	p=0.002	p=0.006	p=0.014
ethresp				
smoke		p=0.034		
poverty4	p=0.002			
ethresp	p=0.012			
health				
poverty4	p=0.002	(p=0.067)	p=0.020	
health				

EXAMPLE MULTIWAYS: PARENTS

*** ANALYSIS OF VARIANCE ***

PERIRON
 BY ETHRESP2 ethnicity black/white
 POV4IN2 poverty index in 2 categories

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif of F
Main Effects	18251.734	2	9125.867	10.277	.000
ETHRESP2	4480.387	1	4480.387	5.045	.027
POV4IN2	10378.935	1	10378.935	11.688	.001
2-way Interactions	998.255	1	998.255	1.124	.291
ETHRESP2 POV4IN2	998.255	1	998.255	1.124	.291
Explained	26491.764	3	8830.588	9.944	.000
Residual	97680.010	110	888.000		
Total	124171.774	113	1098.865		

200 Cases were processed.
 86 Cases (43.0 PCT) were missing.

*** CELL MEANS ***

TOTAL POPULATION
 76.67
 (114)

ETHRESP2
 1 2
 89.69 72.23
 (29) (85)

POV4IN2
 0 1
 90.19 62.67
 (58) (56)

POV4IN2
 0 1
 ETHRESP2
 1 95.56 80.09
 (18) (11)
 2 87.78 58.41
 (40) (45)

VARIETY FREQUENCY SCORES AND HEALTHY DIET SCORES

table 6: Oneway ANOVA - material poverty index, smoking with Variety Frequency Scores and Healthy Diet Scores

	<i>material poverty index</i>	<i>smoking</i>
a_abs	p=0.0001	p=0.0231
a_veg	p=0.0047	
a_fruit	p=0.0000	p=0.0001
a_hdiet	p=0.0000	p=0.0110
c_abs		
c_veg		
c_fruit	p=0.0011	p=0.0424
c_hdiet	p=0.0000	

table 7.

Oneway ANOVA - Demographic Variables and Variety Frequency Indices

	age	agegp	ethresp	famcirc2	fsize
a abs			p = 0.0000		
a fish			p = 0.0000		
a meatp					
a veg			p = 0.0256		
a fruit		p = 0.0249	p = 0.0003		
a cer			p = 0.0014		
a hdiet	p = 0.0063	p = 0.0306	p = 0.0002		
c abs	p = 0.0000	p = 0.0202	p = 0.0021		p = 0.0149
c fish			p = 0.0000		
c meatp					
c veg	p = 0.0001		p = 0.0306		
c fruit	p = 0.0080	p = 0.0300			
c cer	p = 0.0002	p = 0.0138			
c hdiet			p = 0.0057		

Table 8.

Oneway ANOVA - Shopping Variables and Variety Frequency Indices

	whereday	whheavy	whfrtveg	wmeatlis	fregeday	freghevy
a abs	p = 0.0334	p = 0.0007		p = 0.0030		
a fish				p = 0.0074		
a meatp						
a veg	p = 0.0230	p = 0.0010		p = 0.0002		p = 0.0309
a fruit		p = 0.0024		p = 0.0096		
a cer	p = 0.0168	p = 0.0086		p = 0.0070		p = 0.0163
a hdiet	p = 0.0122	p = 0.0001		p = 0.0000		p = 0.0172
c abs				p = 0.0425		
c fish				p = 0.0039		
c meatp						
c veg						
c fruit						
c cer				p = 0.0382		
c hdiet		p = 0.0024		p = 0.0030		

Table 9: Oneway ANOVA - Socio-Economic Variables and Variety Frequency Indices

	qualif	sclass	is	owncar	houseown	perdfd1	perdfd2	employed
a abs	p = 0.0218	p = 0.0001	p = 0.0010		p = 0.0084			p = 0.0003
a fish	p = 0.0126	p = 0.0286	p = 0.0369					p = 0.0082
a meatp								
a veg	p = 0.0003	p = 0.0005	p = 0.0077	p = 0.0273	p = 0.0089			p = 0.0024
a fruit	p = 0.0014	p = 0.0000	p = 0.0002	p = 0.0015	p = 0.0001	p = 0.0334		p = 0.0001
a cer		p = 0.0229						
a hdiet	p = 0.0000	p = 0.0000	p = 0.0001	p = 0.0104	p = 0.0002			p = 0.0003
c abs		p = 0.0172						p = 0.0090
c fish	p = 0.0297	p = 0.0062						p = 0.0112
c meatp								
c veg	p = 0.0176	p = 0.0043						p = 0.0276
c fruit	p = 0.0112	p = 0.0010	p = 0.0024	p = 0.0001	p = 0.0006			p = 0.0016
c cer								
c hdiet	p = 0.0000	p = 0.0000	p = 0.0026	p = 0.0354	p = 0.0302			p = 0.0073

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EXAMPLE: CHILDREN HDS

----- O N E W A Y -----

Variable C_HDIET children: healthy eating score
By Variable FRESH look for [in] food: freshness

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	991775.0730	991775.0730	62.9206	.0000
Within Groups	177	2789930.156	15762.3173		
Total	178	3781705.229			

Group	Count	Mean	Standard Deviation	Standard Error	95 Pct Conf Int for Mean
Yes	65	215.1692	127.8555	15.8585	183.4882 To 246.8503
No	114	60.3860	124.2222	11.6345	37.3360 To 83.4360
Total	179	116.5922	145.7585	10.8945	95.0932 To 138.0912

Group	Minimum	Maximum
Yes	-68.0000	476.0000
No	-225.0000	358.0000
Total	-225.0000	476.0000

table 2: Multi-way ANOVA - Demographic Variables and Variety Frequency Indices

	age	agegp	ethresp	famcirc2	fsize
a abs			p = 0.000		
a fish			p = 0.000		
a meatp					
a veg			p = 0.026		
a fruit		p = 0.049	p = 0.000		
a cer			p = 0.001		
a hdiet			p = 0.000		
c abs	p = 0.000		p = 0.000		
c fish			p = 0.000		
c meatp					
c veg	p = 0.000		p = 0.005		
c fruit	p = 0.045				
c cer	p = 0.010				
c hdiet			p = 0.006		

table 13: Multi-way ANOVA - Socio-Economic Variables and Variety Frequency Indices

	qualif	sclass	is	owncar	houseown	percd1	percd2	employed
a abs (*)								
a fish	p = 0.029							
a meatp								
a veg	p = 0.032							
a fruit								
a cer		p = 0.023						
a hdiet		p = 0.002						
c abs								
c fish								
c meatp								
c veg								
c fruit								
c cer								
c hdiet		p = 0.004						

(*) = Significant interactions found - see SPSS/PC+ output

Table 14: Multi-way ANOVA - Budgeting Variables and Variety Frequency Indices

	dd	keystamp	budgacc	putaside	paybill	catalog	deficit	planbudg
a abs	p = 0.022	p = 0.011				p = 0.014		
a fish		p = 0.001						
a meatp						p = 0.045		
a veg (*)						p = 0.001		
a fruit	p = 0.012	p = 0.004				p = 0.002		
a cer	p = 0.021	p = 0.045						
a hdiet	p = 0.047	p = 0.000				p = 0.000		
c abs								
c fish								
c meatp								
c veg						p = 0.036		
c fruit						p = 0.014		
c cer								
c hdiet		p = 0.000				p = 0.000		

(*) = Significant interactions found - see SPSS/PC+ output

Table 15: Multi-way ANOVA - Cooking and Eating Variables and Variety Frequency Indices

	likecook	wkcook	satcook	heatcook	mealtog	eatsame	tae1oft
a abs				p = 0.001			
a fish		p = 0.047					
a meatp		p = 0.001					
a veg							
a fruit						p = 0.025	
a cer				p = 0.043			
a hdiet	p = 0.009	p = 0.000					
c abs				p = 0.012		p = 0.001	
c fish				p = 0.002			
c meatp							
c veg				p = 0.050		p = 0.017	
c fruit							
c cer (*)				p = 0.006		p = 0.004	
c hdiet	p = 0.010	p = 0.000		p = 0.026			

(*) = Significant interactions found - see SPSS/PC+ output

Table 16: Multi-way ANOVA - Shopping Variables and Variety Frequency Indices

	whereday	whheavy	whfrtveg	wmeatfis	freqeday	freqheavy
a_abs		p = 0.014		p = 0.017		
a_fish				p = 0.007		
a_meatp						
a_veg (*)		p = 0.050		p = 0.003		
a_fruit		p = 0.023				
a_cer				p = 0.012		p = 0.035
a_hdiet (*)		p = 0.019		p = 0.002		p = 0.040
c_abs				p = 0.042		
c_fish				p = 0.004		
c_meatp						
c_veg						
c_fruit						
c_cer				p = 0.038		
c_hdiet		p = 0.034		p = 0.023		

(*) = Significant interactions found - see SPSS/PC+ output

Table 17: Multi-way ANOVA - Food-Aims Variables and Variety Frequency Indices

	aimvar	healthy	vfm	cheap	ilike	childeat	fresh
a abs		p = 0.050		p = 0.045			p = 0.000
a fish						p = 0.050	
a meatp				p = 0.000			
a veg	p = 0.015						p = 0.000
a fruit (*)		p = 0.002		p = 0.001		p = 0.017	p = 0.000
a cer							p = 0.000
a hdiet (*)		p = 0.004		p = 0.008		p = 0.004	p = 0.000
c abs							p = 0.000
c fish			p = 0.025				p = 0.000
c meatp				p = 0.016			
c veg	p = 0.003						p = 0.000
c fruit (*)	p = 0.002			p = 0.001			p = 0.000
c cer (*)							p = 0.000
c hdiet	p = 0.003	p = 0.003				p = 0.002	p = 0.000

(*) = Significant interactions found - see SPSS/PC+ output

table 1 g

Multi-way ANOVA - summary independent variables with Variety Frequency Scores and Healthy Diet Scores

socio-economic		demographic		food choice/aims					cook
	pov index	ethresp	age	fresh	cheap	aimvar	healthy	childeat	wkcook
a abs	p=0.005	p=0.000		p=0.000					
a_veg				p=0.000		p=0.052			
a_fruit	p=0.000	p=0.000		p=0.000	p=0.003		p=0.016		
a_hdiet	p=0.012	p=0.001		p=0.000	p=0.001		p=0.000	P=0.027	
c_abs		p=0.001	p=0.000	p=0.000					
c_veg				p=0.000		p=0.015			
c_fruit	p=0.050			p=0.000	p=0.003				
c_hdiet	p=0.022			p=0.000		p=0.023		p=0.010	p=0.000

APPENDIX J

table 1: Correlation matrix for "food choice" variables

	HEALTH	YCHOOSE	ILIKE	CHILDEAT	VFM	CHEAP
HEALTH	1.0000	-.1168	.0193	.0222	-.1168	-.0981
YCHOOSE	-.1168	1.0000	-.0497	.0748	-.2364**	-.0323
ILIKE	.0193	-.0497	1.0000	.3218**	-.0892	-.0865
CHILDEAT	.0222	.0748	.3218**	1.0000	.0156	-.0461
VFM	-.1168	-.2364**	-.0892	.0156	1.0000	-.2802**
CHEAP	-.0981	-.0323	-.0865	-.0461	-.2802**	1.0000
FRESH	.0222	-.1776*	-.1905*	-.3686**	.1465	-.1136
SPOFFER	-.0195	.1045	-.0926	.0608	-.0455	.0651
QUALITY	.0662	-.1304	-.2181*	-.2704**	.2165*	-.2880**
FANCY	-.0965	.0090	.0132	-.0394	.0586	-.0857
AFFORD	.0277	.0560	-.0519	.0377	-.1013	-.0062

Correlations:	FRESH	SPOFFER	QUALITY	FANCY	AFFORD
HEALTH	.0222	-.0195	.0662	-.0965	.0277
YCHOOSE	-.1776*	.1045	-.1304	.0090	.0560
ILIKE	-.1905*	-.0926	-.2181*	.0132	-.0519
CHILDEAT	-.3686**	.0608	-.2704**	-.0394	.0377
VFM	.1465	-.0455	.2165*	.0586	-.1013
CHEAP	-.1136	.0651	-.2880**	-.0857	-.0062
FRESH	1.0000	-.1356	.2068*	-.0881	-.1950*
SPOFFER	-.1356	1.0000	-.0735	.0518	-.0948
QUALITY	.2068*	-.0735	1.0000	-.1534	-.1118
FANCY	-.0881	.0518	-.1534	1.0000	-.0588
AFFORD	-.1950*	-.0948	-.1118	-.0588	1.0000

N of cases: 189 1-tailed Signif: * - .01 ** - .001

table 2: Correlation matrix for "food aims" variables

	AIMNOHUN	AIMHEALT	CHGDIET	AIMVAR	FAMILY	BALANCE
AIMNOHUN	1.0000	-.2683**	-.0173	-.0749	-.1687	-.1901*
AIMHEALT	-.2683**	1.0000	-.0560	-.1041	-.0717	.0368
CHGDIET	-.0173	-.0560	1.0000	.0368	-.0507	.0424
AIMVAR	-.0749	-.1041	.0368	1.0000	.0487	.0522
FAMILY	-.1687	-.0717	-.0507	.0487	1.0000	-.0676
BALANCE	-.1901*	.0368	.0424	.0522	-.0676	1.0000
FUTURE	.1086	-.0155	-.1280	-.0905	-.0064	-.0207
ENJOY	-.1041	-.0813	-.0341	.2631**	-.0684	.0134

Correlations:	FUTURE	ENJOY
AIMNOHUN	.1086	-.1041
AIMHEALT	-.0155	-.0813
CHGDIET	-.1280	-.0341
AIMVAR	-.0905	.2631**
FAMILY	-.0064	-.0684
BALANCE	-.0207	.0134
FUTURE	1.0000	.0397
ENJOY	.0397	1.0000

N of cases: 183 1-tailed Signif: * - .01 ** - .001

table 3: Correlation matrix of "food choice" and "food aim" variables

Correlations:	AIMNOHUN	AIMHEALT	CHGDIET	AIMVAR	FAMILY	BALANCE
AIMNOHUN	1.0000	-.2636**	-.0353	-.1021	-.1666	-.1861*
AIMHEALT	-.2636**	1.0000	-.0491	-.0955	-.0734	.0344
CHGDIET	-.0353	-.0491	1.0000	.0126	-.0475	.0487
AIMVAR	-.1021	-.0955	.0126	1.0000	.0547	.0616
FAMILY	-.1666	-.0734	-.0475	.0547	1.0000	-.0689
BALANCE	-.1861*	.0344	.0487	.0616	-.0689	1.0000
FUTURE	.1118	-.0165	-.1269	-.0889	-.0068	-.0215
ENJOY	-.1008	-.0833	-.0301	.2740**	-.0693	.0120
HEALTH	-.1230	.2904**	-.0502	.0658	-.1073	-.0042
YCHOOSE	-.0675	-.0443	-.0011	-.0201	-.0048	.0011
ILIKE	.0054	-.1125	-.1395	-.0580	.0739	-.0611
CHILDEAT	-.0614	-.0094	-.1414	-.1037	.1271	-.0565
VFM	.0633	.0678	-.0403	.0497	-.0174	.0263
CHEAP	.1587	-.1185	-.0552	-.0325	.0620	-.0756
FRESH	.0855	.1369	.0855	-.0121	.0144	.0070
SPOFFER	-.0639	-.0281	.0126	-.0079	.0547	.0984
QUALITY	-.0562	.0435	.1973*	-.0089	-.1706	.1220

Correlations:	AIMNOHUN	AIMHEALT	CHGDIET	AIMVAR	FAMILY	BALANCE
FANCY	.0362	-.0341	.0362	-.0227	-.0154	-.0349
AFFORD	-.0773	.0159	-.0206	.0486	-.0894	-.0349

Correlations:	FUTURE	ENJOY	HEALTH	YCHOOSE	ILIKE	CHILDEAT
AIMNOHUN	.1118	-.1008	-.1230	-.0675	.0054	-.0614
AIMHEALT	-.0165	-.0833	.2904**	-.0443	-.1125	-.0094
CHGDIET	-.1269	-.0301	-.0502	-.0011	-.1395	-.1414
AIMVAR	-.0889	.2740**	.0658	-.0201	-.0580	-.1037
FAMILY	-.0068	-.0693	-.1073	-.0048	.0739	.1271
BALANCE	-.0215	.0120	-.0042	.0011	-.0611	-.0565
FUTURE	1.0000	.0392	-.0239	-.1093	-.0268	-.0738
ENJOY	.0392	1.0000	.0295	.0224	-.0325	-.0617
HEALTH	-.0239	.0295	1.0000	-.1207	.0202	.0243
YCHOOSE	-.1093	.0224	-.1207	1.0000	-.0423	.0904
ILIKE	-.0268	-.0325	.0202	-.0423	1.0000	.3309**
CHILDEAT	-.0738	-.0617	.0243	.0904	.3309**	1.0000
VFM	.1369	.0642	-.1209	-.2329**	-.0715	.0004
CHEAP	-.1762*	-.0259	-.0987	-.0496	-.0937	-.0417
FRESH	.1293	.0211	.0148	-.1810*	-.1894*	-.3696**
SPOFFER	-.0889	.0078	-.0256	.1048	-.0943	.0636
QUALITY	.0155	.0731	.0620	-.1312	-.2174*	-.2923**

Correlations:	FUTURE	ENJOY	HEALTH	YCHOOSE	ILIKE	
CHILDEAT						
FANCY	.2786**	.0268	-.1006	.0082	.0137	-.0393
AFFORD	-.0550	.0927	.0350	.0700	-.0404	.0104

Correlations:	VFM	CHEAP	FRESH	SPOFFER	QUALITY	FANCY
AIMNOHUN	.0633	.1587	.0855	-.0639	-.0562	.0362
AIMHEALT	.0678	-.1185	.1369	-.0281	.0435	-.0341
CHGDIET	-.0403	-.0552	.0855	.0126	.1973*	.0362
AIMVAR	.0497	-.0325	-.0121	-.0079	-.0089	-.0227
FAMILY	-.0174	.0620	.0144	.0547	-.1706	-.0154
BALANCE	.0263	-.0756	.0070	.0984	.1220	-.0349
FUTURE	.1369	-.1762*	.1293	-.0889	.0155	.2786**
ENJOY	.0642	-.0259	.0211	.0078	.0731	.0268
HEALTH	-.1209	-.0987	.0148	-.0256	.0620	-.1006
YCHOOSE	-.2329**	-.0496	-.1810*	.1048	-.1312	.0082
ILIKE	-.0715	-.0937	-.1894*	-.0943	-.2174*	.0137
CHILDEAT	.0004	-.0417	-.3696**	.0636	-.2923**	-.0393
VFM	1.0000	-.2616**	.1367	-.0479	.2086*	.0589
CHEAP	-.2616**	1.0000	-.1054	.0682	-.2857**	-.0865
FRESH	.1367	-.1054	1.0000	-.1452	.2096*	-.0940
SPOFFER	-.0479	.0682	-.1452	1.0000	-.0797	.0486
QUALITY	.2086*	-.2857**	.2096*	-.0797	1.0000	-.1587

Correlations:	VFM	CHEAP	FRESH	SPOFFER	QUALITY	FANCY
FANCY	.0589	-.0865	-.0940	.0486	-.1587	1.0000
AFFORD	-.1342	.0131	-.1928*	-.0940	-.1062	-.0581

Correlations: AFFORD

AIMNOHUN	-.0773
AIMHEALT	.0159
CHGDIET	-.0206
AIMVAR	.0486
FAMILY	-.0894
BALANCE	-.0349
FUTURE	-.0550
ENJOY	.0927
HEALTH	.0350
YCHOOSE	.0700
ILIKE	-.0404
CHILDEAT	.0104
VFM	-.1342
CHEAP	.0131
FRESH	-.1928*
SPOFFER	-.0940
QUALITY	-.1062

Correlations: AFFORD

FANCY	-.0581
AFFORD	1.0000

N of cases: 182 1-tailed Signif: * - .01 ** - .001

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